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Tropical Fungi — V

New Species and Revisions.

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The present paper continues No. IV of this series, (Proc. Linn. Soc. London, 165: in press. 1954) and deals with specimens forwarded to me for examination from the herbaria of Stockholm, Kew, Paris and Harvard.

(239) **Amazonia piperis** (Syd) Hansf., comb. n. (3101.32×0)

Syn.: *Actinodothis piperis* Syd., Phil. Journ. Sci. Bot., **9:** 175, 1914.

Colonies epiphyllous, black, dense, crustose, to 4 mm diam., causing a blackening of the underlying epidermis and evagination of the leaf, apparently strongly parasitic. There is no penetration of the host, save for the epidermal haustoria typical of this genus. Mycelium of substraight closely radiating, dark brown hyphae 5—7 μ thick, the cells mostly 8—12 μ long, branching alternate or irregular, the whole forming almost a continous pellicle of a single layer. Capitate hyphopodia alternate, antrorse, 12—15 μ long; stalk cell cuneate, 3—6 μ long; head cell globose to wide ovate, entire, 7—11 ⇌ 7—9 μ. Mucronate hyphopodia not seen. Setae none. Perithecia commencing as flat plates of radiate hyphae, becoming raised in the centre, immature. Spores brown, oblong, obtuse, 4-septate, rather deeply constricted, 34—38 ⇌ 13—15 μ.

On *Piper* spec., Amboina, Robinson 2208, det. Sydow as *Actinodothis piperis* Syd.

(240) **Irenopsis cornuta** (Rehm) Hansf., comb. n. (3401.3220)

Syn.: *Meliola cornuta* Rehm, Hedwigia 40: 163. 1901.

Herb. Kew contains a specimen on *Dicksonia* sp., Santa Catharina, Brazil, Ule, Herb. brasil. 860:

Colonies amphigenous, mostly hypophyllous, thin, spreading over the leaflets. Mycelium of straight to flexuous dark brown hyphae

6—7 μ thick, the cells mostly 25—40 μ long, branching opposite or irregular, loosely reticulate. Capitate hyphopodia alternate only, straight or bent, 15—30 μ long; head cell widely ovate to piriform, entire, widely rounded at apex, 10—15 ⇌ 9—11 μ; stalk cell cylindric, 5—15 μ long. Mucronate hyphopodia mixed with capitate, opposite or alternate, bent ampulliform, 15—20 ⇌ 6—8 μ, neck 3 μ thick. Setae none on mycelium. Perithecia loosely scattered, black, globose, verrucose, up to 160 μ diam., above with 0—6 erect-spreading setae up to 120 ⇌ 7—8 μ ,simple, obtuse, bent or uncinate to loosely coiled at the apex, indistinctly 1—2-septate, thick-walled, smooth. Spores dark brown, cylindric to subellipsoid, 4-septate, constricted, obtuse, 35—39 ⇌ 11—13 μ.

(241) **Irenopsis hoheriae Hansf.,** sp. n. (3401. 4220).

Plagulae epiphyllae, subtenues, usque ad 2 mm diam., subinde confluentes. Mycelium ex hyphis atrobrunneis, undulatis, 6—7 μ cr. (cellulis plerumque 15—20 μ longis), opposite vel irregulariter ramosis, laxe reticulatis compositum. Hyphopodia capitata alternata, antrorsa, recta, 16—21 μ longa, cellula basali cylindracea, 4—7 μ longa, cellula apicali irregulariter lobata vel angulosa, 10—14 ⇌ 10—13 μ. Hyphopodia mucronata opposita vel alternata, ampullacea, curvata, 14—22 ⇌ 7—9 μ, collo 3—4 μ crasso. Setae myceliales nullae. Perithecia dispersa, atra, globosa, verrucosa, usque ad 190 μ diam., superne setis 8—12, erecto-patentibus, rectis vel leniter flexuosis, simplicibus, obtusis vel acutis, dilute brunneis, continuis, levibus, usque ad 110 ⇌ 7—8 μ ornata. Sporae atrobrunneae, ellipsoideae, obtusae, 4-septatae, constrictae, 38—45 ⇌ 17—19 ⇌ 14—15 μ.

Hab. in foliis *Hoheriae sexstylosae.* New Zeland, Colenso b-133, in Herb. Kew.

(242) **Irenopsis malpighiicola** Hansf., sp. n. (3401. 5220).

Plagulae hypophyllae in tomento folii, tenues vel subdensae, leves, usque ad 1 mm diam. vel numerosae confluentesque. Mycelium ex hyphis atrobrunneis, undulatis vel flexuosis, 7—9 μ cr. (cellulis plerumque 20—30 μ longis), opposite vel irregulariter ramosis, subdense reticulatis compositum. Hyphopodia capitata alternata, recta vel curvula, 20—27 μ longa, cellula basali cylindracea vel cuneata, 5—9 μ longa, cellula apicali globosa vel late piriformia, integra vel raro leniter rotundato-angulosa, 15—20 ⇌ 12—16 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 16—22 ⇌ 7—9 μ, collo suberecto, 3—4 μ crasso. Setae myceliales nullae. Perithecia dispersa, atra, globosa, verrucosa, usque ad 190 μ diam., superne setis 2—12, erecto-patentibus, usque ad 140 ⇌ 6—7 μ, simplicibus, obtusis, saepe spiraliter contortibus, 1—2-septatis, sursum sparse granulosis ornata. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 45—53 ⇌ 16—19 ⇌ 13—15 μ.

Hab. in foliis Malpighiacearum spec. indet., Santa Catharina, Brazil, U l e, Herb. brasil. 479, typus in Herb. Stockholm.

(243) **Irenopsis omphaleae** Hansf., sp. n. (3401. 5330).

Plagulae amphigenae, tenuissimae, effusae, confluentes, leves. Mycelium ex hyphis subrectis vel undulatis, atrobrunneis, 7—9 μ cr. (cellulis plerumque 20—30 μ longis), opposite vel irregulariter ramosis, laxe reticulatis compositum. Hyphopodia capitata alternata, plus minusve antrorsa, recta vel curvata, 22—30 μ longa, cellula basali cylindracea, 5—9 μ longa, cellula apicali oblonga, piriforme, rotundato-angulosa vel irregulariter palmato-lobata, 18—23 ⇌ 10—17 μ. Hyphopodia mucronata illis capitatis commixta, ampullacea, curvata, 20—40 ⇌ 6—9 μ, collo elongato, 3 μ cr. Setae myceliales nullae. Perithecia laxe dispersa, atra, globosa, verrucosa, usque ad 215 μ diam., superne setis 0—10, erecto-patentibus, simplicibus, obtusis, uncinatis, levibus, continuis, usque ad 130 ⇌ 7 μ, ornata. Sporae ellipsoideae, obtusae, atrobrunneae, 4-septatae, constrictae, 45—50 ⇌ 22—25 μ.

Hab. in foliis *Omphaleae pauciflorae*, San Domingo, C i f e r r i, Mycofl. doming. exs. 269 p. p.; typus in Herb. Kew.

This differs very markedly from *Meliola (Irenina) funebris* Cif., as described in Ann. Myc. **36**: 210. 1938, with which it is mixed in the above specimen, which forms part of the type of C i f e r r i's species.

(244) **Irenopsis quercifolia** Hansf., sp. n. (3401. 3220).

Plagulae epiphyllae, subdensae, leves, usque ad 4 mm diam., subinde confluentes. Mycelium ex hyphis atrobrunneis, leniter undulatis, 6—7 μ cr. (cellulis circa 15—20 μ longis), opposite ramosis, laxe reticulatis compositum, in centro plagularum subdense intertextum. Hyphopodia capitata alternata, plus minusve curvata, saepe reflexa, 15—22 μ longa, cellula basali cylindracea, 3—7 μ longa, cellula apicali oblonga, apice rotundata, vel saepe irregulariter angulosa, subinde sublobata, 12—18 ⇌ 8—11 μ. Hyphopodia mucronata numerosa, alternata, opposita vel interdum ternata, ampullacea, curvata, 15—23 ⇌ 7—9 μ, illis capitatis commixta, collo suberecto, 3 μ cr. Setae myceliales nullae. Perithecia laxe dispersa, atra, globosa, verrucosa, usque ad 180 μ diam., superne setis 3—12, erecto patentibus, atrobrunneis, obtusis, levibus, crasse tunicatis, 2—3-septatis, usque ad 110 ⇌ 6—7 μ, apice rectis, curvatis vel leniter spiraliter incurvis ornata. Sporae atrobrunneae, subellipsoideae obtusae, 4-septatae, constrictae, 34—39 ⇌ 15—18 ⇌ 12—14 μ.

Hab. in foliis *Querci nigrae*, Baton Rouge, Louisiana, Jan. 1907, leg. H. R. F u l t o n (typus in Herb. Farlow); in foliis *Querci* spec. indet., Eustis, Florida, Sept. 1897, R. T h a x t e r, in Herb. Farlow.

(245) **Irene aucubae** (P. Henn.) Hansf., comb. n. (3101. 5330).

Syn.: *Meliola aucubae* P. Henn., Englers Bot. Jahrb., **29**: 150. 1901. — *Irenina aucubae* (P. Henn.) Stev., Ann. Myc., **25**: 455. 1927.

The type specimen, on *Aucuba japonica,* Tse, Japan, June 1899, leg. M. S h i r a i, in Herb. Stockholm, has been re-examined:

Colonies hypophyllous, rather dense, 2—4 mm diam., not usually confluent. Mycelium of somewhat crooked to undulate, dark brown hyphae 7—9 μ thick, the cells mostly 25—35 μ long, branching usually opposite at wide angles, loosely reticulate, becoming denser in older colonies. Capitate hyphopodia alternate or unilateral, or sometimes more scattered, often in groups of 3—4 along the hyphae, antrorse-bent, 25—35 μ long; stalk cell cylindric to cuneate, 7—13 μ long; head cell irregularly rounded-angulose to shallowly lobate, 18—26 ⇌ 17—22 μ. Mucronate hyphopodia mixed with capitate, opposite or alternate, bent ampulliform to lageniform, 13—22 ⇌ 7—10 μ, neck 3 μ thick. Mycelial setae none. Perithecia scattered, black, globose, very rough, up to 270 μ diam.; surface cells bent conoid, projecting to 25 μ, about 40—50 μ diam. at the base. Spores dark brown, cylindric, obtuse, 4-septate, constricted, 45—51 ⇌ 18—21 ⇌ 14—18 μ.

(246) **Irene brachycera** (Syd.) Hansf., comb. n. (3101, 4220).

Syn.: *Meliola brachycera* Syd., Ann. Myc. **24**: 297. 1926.

True mycelial setae are absent from this species, but many hyphae are more or less ascending, though their tips often again fall down to the leaf surface, where they continue as normal hyphopodiate hyphae. The mycelium penetrates through and below the dense tomentum of the leaf, the hyphae have cells 25—50 ⇌ 4—7 μ, flexuous to geniculate, branching irregular. Capitate hyphopodia alternate or thinly scattered, up to 40 μ long; stalk cell cylindric, often irregularly bent, 5—25 ⇌ 5—8 μ; head cell subglobose, ovate, clavate or irregularly angulose, 9—20 ⇌ 9—16 μ. Mucronate hyphopodia few, scattered, opposite or unilateral, elongate, irregularly bent, 25—33 ⇌ 5—8 μ. Perithecia loosely scattered, black, globose, to 200 μ diam., surface cells bluntly conoid or mammillate, or sometimes produced into bent cylindric processes up to 25—30 μ high with obtuse conoid tips and irregularly transversely furrowed sides. Spores bent ellipsoid, obtuse, 4-septate, 38—45 ⇌ 15—18 ⇌ 15 μ.

On *Conostegia lanceolata,* Costa Rica, S y d o w, Fungi exot. exs. 616; S y d o w, Fungi costaric. 250.

In both specimens this species is always hypophyllous; on the upper surface of both is *Irenopsis conostegiae* Stev.

(247) **Irene forschhammeriae** Hansf., sp. n. (3103. 4230).

Plagulae amphigenae, densae, leves, usque ad 3 mm diam., vel numerosae et confluentes. Mycelium ex hyphis atrobrunneis, sub-

rectis, 6—8 μ cr. (cellulis plerumque 15—25 μ longis), opposite acuteque ramosis, dense radianto-reticulatis compositum. Hyphopodia capitata alternata vel circa 5—10% opposita, recta vel curvata, antrorsa, 14—23 μ longa, cellula basali cylindracea, 3—9 μ longa; cellula apicali oblongo-clavulata, apice rotundata, recta vel curvata, interdum subangulosa vel sublobata, 10—16 ⇌ 8—11 μ. Hyphopodia mucronata numerosa, illis capitatis commixta, opposita, alternata vel raro ternata, ampullacea vel conoidea, 14—21 ⇌ 6—8 μ, collo 3—4 μ cr. Setae nullae. Perithecia laxe aggregata, atra, globosa, verrucosa, usque ad 260 μ diam., cellulis parietis obtuse conoideis, usque ad 50 μ alt. Sporae subellipsoideae, atrobrunneae, obtusae, 4-sepatae, constrictae, 36—44 ⇌ 15—17 ⇌ 13—15 μ.

Hab. in foliis *Forschhammeriae lucidae,* Manzanillo, Mexico, Palmer 1366 (typus in Herb. Farlow); in foliis *F. pallidae,* Agiatampo, Mexico, Palmer, s. n. in Herb. Farlow.

(248) **Irene guioae** Hansf., sp. n. (3103. 4320).

Plagulae epiphyllae, tenuissimae, leves, usque ad 3 mm diam. Mycelium ex hyphis atrobrunneis, rectis, 6—7 μ cr. (cellulis plerumque 20—25 μ longis), opposite lateque ramosis, laxe vel subdense reticulatis compositum. Hyphopodia capitata opposita vel circa 10% alternata, patentia, recta, 11—16 μ longa, cellula basali cylindracea, 2—5 μ longa, cellula apicali cylindracea, apice late rotundata, 10—13 ⇌ 6—8 μ. Hyphopodia mucronata illis capitatis commixta, haud numerosa, opposita vel alternata, ampullacea, 13—18 ⇌ 6—8 μ, collo erecto 3—5 μ cr. Setae nullae. Perithecia dispersa, globosa, atra, verrucosa, usque ad 180 μ diam. Sporae atrobrunneae, cylindraceae vel subellipsoideae, obtusae, 4-septatae, constrictae, 38—48 ⇌ 18—21 μ.

Hab. in foliis *Guioae perrottetii,* Rizal, Luzon, Philippines, Phil. Bur. Sci. 21921, leg. Ramos, in Herb. Pretoria et Herb. Stockholm.

(249) *Irene inermis* (K. & C.) Theiss. & Syd., Ann. Myc. **15**: 194. 1917.

Syn.: *Meliola inermis* Kalchor. & Cke., Grevillea 9: 34. 1880. — *M. quinqueseptata* Rehm, Ascomycetes no. 492.

Theissen & Sydow made this species the type of their new genus *Irene,* defining this as a *Meliola* without setae; and this represented the first genus segregated from *Meliola* Fr. In Sitzb. K. Akad. Wiss. Wien, **128**: 556, 1919, Hoehnel made a further division of *Irene,* by splitting off his new genus *Appendiculella* for those species having „larviform appendages", with *A. calostroma* (Desm.) Hoehnel as type. Stevens, Ann. Myc. **25**: 420, 1927, introduced confusion into this separation of the genera, by stating that *Irene inermis* possessed larviform appendages, and hence concluded that *Appendiculella* was a synonym of *Irene*; he then

erected the new genus *Irenina* for the group of species not having these appendages.

Both Dr. E. M. Doidge and myself have examined a wide range of collections of *I. inermis* in South Africa, and we are agreed that there are no elongate „larviform appendages" on its perithecia, but merely obtusely conoid surface cells, which occasionally reach up to 25—30 μ high. Hence Stevens was in error in his synonomy, as also in his application of the generic name *Irene*. As *I. inermis* is the type species of this genus, the latter must be reserved for all species having neither setae nor appendages, and hence Stevens' genus *Irenina* is a synonym. Since 1927 many other species have been described in *„Irenina"*, which must be transferred to *Irene*. Those species which Stevens included in *Irene* all belong to *Appendiculella* Hoehn., as well as many others described since 1927.

Irene inermis occurs on *Buddleia* spp. and *Chilianthus* spp. in South Africa, and what I regard as identical is present on *Buddleia* sp., Sierra Geral, Santa Catharina, Brazil, Ule, Herb. brasil. 1716, in Herb. Kew; this represents the only specimen of this species I have seen collected outside South Africa.

From this the following are distinct:

(a) **Irene acervata** (Ell. & Ev.) Hansf., comb. n.

Syn.: *Meliola acervata* Ell. & Ev., Bull. Torr. Bot. Club, **24**: 126. 1897. — *Irenina acervata* (Ell. & Ev.) Hansf., Proc. Linn. Soc. London, **160**: 131. 1948.

(b) **Irene anthocleistae** (Hansf. & Deight.) Hansf., comb. n.

Syn.: *Irenina anthocleistae* Hansf. & Deight., Mycol. Paper **23**: 51. 1948, C.M. I. Kew.

(c) **Irene buddleyicola** (P. Henn.) Hansf., comb. n.

Syn.: *Meliola buddleyicola* P. Henn., Hedwigia **44**: 61. 1904. — *Irenina buddleyicola* (P. Henn.) Stev., Ann. Myc., **25**: 455. 1927.

(d) **Irene buddleiae** (Hansf.) Hansf., comb. n.

Syn.: *Irenina buddleiae* Hansf., Farlowia **3**: 270. 1948.

(e) *Irene implicata* Doidge, Bothalia **1**: 206. 1924.

Syn.: *Irenina implicata* (Doidge) Stev., Ann. Myc. **25**: 465. 1927.

(f) *Irene nuxiae* Syd., Bothalia **2**: 433. 1928.

Syn.: *Irenina nuxiae* (Syd.) Hansf., Proc. Linn. Soc. London **157**: 174. 1946.

Hitherto the only specimen I have encountered under the name *Meliola obducens* Gaill., which Stevens also transferred to *Irenina*, is a collection by Ule, on *Buddleia* sp., Brazil, in Herb. Stockholm ex Herb. Sydow; this collection corresponds closely with Ule 1716, mentioned above as being *Irene inermis*, and it may even be part

of the same original collection, which is probaly the source of Rehm's report as *M. obducens* Gaill., in Hedwigia 40, 1901.

(250) **Irene sapotacearum** Hansf., sp. n. (3101. 3220).

Plagulae epiphyllae, tenues, leves, plus minusve confluentes. Mycelium ex hyphis atrobrunneis, subrectis, 6—7 μ cr. (cellulis plerumque 20—30 μ longis), opposite lateque ramosis, laxe reticulatis compositum. Hyphopodia capitata alternata, antrorsa, 12—18 μ longa, cellula basali cuneata vel cylindracea, 3—6 μ longa, cellula apicali subglobosa, integra, 9—13 ⇌ 9—11 μ. Hyphopodia mucronata, numerosa, illis capitatis commixta, opposita vel alternata, ampullacea, 14—23 ⇌ 6—9 μ, collo 3 μ cr. Setae nullae. Perithecia atra, globosa, verrucosa, usque ad 180 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-spetatae, constrictae, 35—39 ⇌ 12—15 μ.

Hab. in foliis *Sapotacearum* spec. indet., Santa Catharina, Brazil, U l e, Herb. brasil. 92 (typus in Herb. Stockholm).

In this collection the species occurs mixed with the following variety.

(251) **Irene sapotacearum** Hansf. var. **longipoda** Hansf., var. n. (3101. 3220).

Ab typo ita differt: Hyphopodia capitata alternata antrorsa, subrecta, 20—27 μ longa, cellula basali cylindracea vel cuneata, 5—11 μ longa, cellula apicali ovata, integr, 13—17 ⇌ 9—12 μ.

Hab. in foliis *Sapotacearum* spec. indet., Santa Catharina, Brazil, U l e. Herb. brasil. 92 (typus in Herb. Stockholm).

(252) **Irene thwaitesii** Berk. ex Hansf., sp. n. (3101. 4220).

Syn.: *Meliola thwaitesii* Berk. in Herb. Kew, ined.

Plagulae epiphyllae, densae, leves, effusae et late confluentes. Mycelium ex hyphis atrobrunneis, undulatis vel flexuosis, 8—10 μ cr. (cellulis plerumque 15—30 μ longis) opposite vel irregulariter ramosis, laxe vel subdense reticulatis compositum. Hyphopodia capitata alternata, recta, patentia, 20—32 μ longa, cellula basali cylindracea, 7—15 μ longa, cellula apicali globosa, ovata vel lenissime angulosa, 13—20 ⇌ 12—17 μ. Hyphopodia mucronata in hyphis distinctis evoluta, plerumque alternata, ampullacea, curvata, 20—28 ⇌ 8—10 μ, collo elongato, 3 μ crasso. Setae nullae. Perithecia dispersa, altra, globosa, verrucosa, usque ad 170 μ diam., cellulis parietis rotundatis, vix prominentibus. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 40—47 ⇌ 15—18 μ.

Hab. in foliis *Acrotremae* spec. indet., Ceylon, T h w a i t e s s. n., typus in Herb. Kew.

(253) **Irene werdermannii** Hansf., sp. n. (3101. 5340).

Plagulae hypophyllae, usque ad 3 mm. diam., subdensae, leves. Mycelium ex hyphis atrobrunneis, subrectis, 8—10 μ cr. (cellulis

plerumque 30—40 μ longis), opposite vel irregulariter ramosis, subdense reticulatis compositum. Hyphopodia capitata alternata, plus minusve antrorsa, recta vel curvata, 25—43 μ longa, cellula basali cylindracea, 7—15 μ longa, cellula apicali globosa, piriforme, oblonga vel lenissime angulosa, 19—29 ⇌ 12—20 μ. Hyphopodia mucronata in hyphis distinctis evoluta, opposita vel alternata, ampullacea, curvata, 17—25 ⇌ 8—10 μ, collo 4 μ cr. Setae nullae. Perithecia laxe gregaria, atra, globosa, verrucosa, usque ad 350 μ diam., cellulis parietis conoideis vel mammillatibus, circa 40 μ diam. et usque ad 12 μ alt. Sporae atrobrunneae, cylindraceae vel ellipsoideae, obtusae, 4-septatae, constrictae, 50—57 ⇌ 22—26 μ.

Hab. in foliis *Drymidis winteri, Chiloe* Is., Chile, Feb. 1924, Werdermann, in Herb. Stockholm.

(254) **Meliola alternipes** (Speg.) Hansf., comb. n. (3123. 4232).

Syn.: *M. falcatiseta* Speg. var. *alternipes* Speg., Anal. Mus. Nac. Buenos Aires **32**: 374. 1924.

On *Castela coccinea,* Oran, Argentine, Lorentz 26, Oct. 1873, in Herb. Stockholm.

Colonies amphigenous, dense, velvety, 1—2 mm. diam. or confluent. Mycelium of substraight to somewhat crooked dark brown hyphae 7—10 μ thick, the cells mostly 15—25 μ long, branching alternate, less commonly opposite, at wide angles, densely reticulate and almost solid. Capitate hyphopodia alternate or about 2% opposite, usually antrorsely bent, 20—29 μ long; stalk cell bent cylindric, 3—10 μ long; head cell ovate, clavate or cylindric, often irregularly rounded-angulose, rarely sublobed, 13—19 ⇌ 9—15 μ. Mucronate hyphopodia few, scattered, usually alternate, 25—30 ⇌ 8—10 μ, neck elongate, 3 μ thick. Mycelial setae numerous, opaque black, erect, simple, arcuate to uncinate, up to 350 ⇌ 11—13 μ, apex acute when mature. Perithecia scattered, black, globose, verrucose, to 230 μ diam. Spores dark brown, cylindric, obtuse, 4-septate, constricted, 40—48 ⇌ 15—17 μ.

(255) **Meliola apiculata** Hansf., var. **minor** Hansf., var. n. (3111. 42××)

Plagulae amphigenae, subdensae, usque ad 3 mm. diam. Mycelium ex hyphis atrobrunneis, subrectis vel flexuosis, 5—7 μ cr. (cellulis plerumque 15—20 μ longis), alternatim vel irregulariter ramosis, dense reticulatis compositum. Hyphopodia capitata alternata, recta vel curvata, 16—22 μ longa, cellula basali cuneata vel cylindracea, 3—9 μ longa, cellula apicali versiforme, plerumque irregulariter subglobosa vel varie angulosa, 10—18 ⇌ 10—17 μ. Hyphopodia mucronata in hyphis distinctis evoluta, alternata vel opposita, ampullacea, 17—23 ⇌ 7—10 μ, collo 3 μ cr. Setae et perithecia non visa. Sporae atrobrunneae, cylindraceae, utrinque apiculatae, 4-septatae, constrictae, 43—50 ⇌ 14—16 ⇌ 10—12 μ.

Hab. in foliis *Cladii occidentalis,* Cuba, Wright 609 in Herb. Kew. (mixed with *Meliola circinans* Earle).

(256) *Meliola argentina* Speg., var. **africana** Hansf., var. n. (3411. 4224)

Ab typo ita differt: perithecia minora, usque ad 170 μ diam., sporae 38—42 ⇌ 13—15 μ.

Hab. in foliis *Cyperi flabelliformis,* Bwamba, Uganda, Hansford 2731, leg. Thomas; in foliis *Cyperacearum* spec. indet., Semliki Valley, Congo Belge, Hendrickx 2744.

These specimens were formerly determined by me as *Meliola circinans* Earle, but have recently been compared with a specimen from Herb. Stockholm of *M. argentina* Speg., on Cyperaceae indet., Riodiuleo, Argentine, Jan. 1880 (possibly part of the type collection). This has spores 50—62 ⇌ 15—18 μ, with rounded to somewhat attenuate ends, the middle cell often being larger than the others, so that the spores often appear subfusoid; perithecia to 210 μ diam.

(257) **Meliola asperipoda** Hansf., sp. n. (3111. 4231).

Plagulae amphigenae, usque ad 2 mm. diam., subtenues vel densae. Mycelium ex hyphis undulatis, atrobrunneis, 8—9 μ cr. (cellulis plerumque 20—25 μ longis), alternatim acuteque ramosis (raro opposite), laxe vel subdense reticulatis compositum. Hyphopodia capitata alternata, antrorsa, 23—40 μ longa, cellula basali sinuoso-cylindracea, 5—16 μ longa, cellula apicali irregulariter fortiter lobata, versiforme, 15—28 ⇌ 12—22 μ. Hyphopodia mucronata pauca, alternata, ampullacea, curvata, 20—25 ⇌ 6—8 μ. Setae myceliales tenuiter dispersae, etiam juxta perithecia aggregatae, erectae, rectae, simplices, obtusae, usque ad 250 ⇌ 8—10 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 250 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae constrictae 40—46 ⇌ 15—17 ⇌ 14 μ.

Hab. in foliis *Bignoniacearum* spec. indet., Pedras Grandes, Brazil, Ule 1719 p. p., in Herb. Stockholm.

This occurs mixed with *M. newbouldiae* Hansf. & Deight.

(258) **Meliola besleriae** Hansf., sp. n. (3111. 3121).

Plagulae hypophyllae, tenues, usque ad 6 mm. diam., vel confluentes, tenuiter velutinae. Mycelium ex hyphis brunneis, sinuosis, 4—6 μ cr. (cellulis plerumque 20—35 μ longis), opposite ramosis, laxe reticulato-intertextis compositum. Hyphopodia capitata alternata vel distantia, antrorsa, subrecta, 12—20 μ longa, cellula basali cylindracea 2—6 μ longa, cellula apicali subglobosa vel ovata, apice rotundata vel leniter attenuata, integra, 9—16 ⇌ 7—10 μ. Hyphopodia mucronata pauca, illis capitatis commixta, opposita vel unilateralia, ampullacea, curvata, 13—20 ⇌ 6—8 μ, collo 3 μ cr. Setae myceliales laxe dispersae, erectae, rectae vel curvulae, simplices, obtusae, usque ad 280 ⇌ 6—7 μ.

Perithecia dispersa, atra, globosa, verrucosa, usque ad 135 μ diam. Sporae atrobrunneae, cylindraceo-ellipsoideae, obtusae, curvatae, 4-septatae, constrictae, 26—32 ⇌ 9—10 μ.

Hab. in foliis *Besleriae longipedis,* Trinidad, B a k e r, Nov. 1950, in Herb. Kew.

(259) *M e l i o l a b i d e n t a t a* Cooke, var. **minor** Hansf., var. n. (3131. 3222)

Plagulae epiphyllae, tenues vel subdensae, usque ad 3 mm. diam., saepe confluentes. Mycelium ex hyphis atrobrunneis subrectis vel undulatis, 6—7 μ cr. (cellulis plerumque 20—25 μ longis), opposite acuteque ramosis, laxe vel subdense reticulatis compositum. Hyphopodia capitata alternata, antrorsa, subrecta, 18—26 μ longa, cellula basali cuneata vel cylindracea, 4—9 μ longa, cellula apicali elongato-ovata, integra, apice late vel attenuato-rotundata, 11—17 ⇌ 8—10 μ. Hyphopodia mucronata in hyphis distinctis in centro plagularum evoluta, opposita vel alternata, ampullacea, 13—22 ⇌ 6—8 μ, collo 3 μ cr. Setae myceliales dispersae, erectae, rectae, usque ad 480 ⇌ 7—9 μ, apice 2—4-dentatae usque ad 12 μ. Perithecia dispersa, atra, globosa, verrucosa usque ad 170 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 34—39 ⇌ 12—13 ⇌ 9—10 μ.

Hab. in foliis *Bignoniacearum* spec. indet., Guarapi, Paraguay, B a l a n s a 2730 in Herb. Kew.

(260) **Meliola brooksii** Hansf., sp. n. (3121. 5232).

Plagulae amphigenae, usque ad 3 mm. diam. densae, crustosae, adhaerentes, velutinae. Mycelium ex hyphis subrectis vel leniter undulatis, atrobrunneis, 6—9 μ cr. (cellulis plerumque 10—15 μ longis), opposite vel irregulariter ramosis, densissime reticulatis compositum, subsolidum. Hyphopodia capitata alternata, recta vel antrorsa, 12—18 μ longa, cellula basali cylindracea, 2—5 μ longa, cellula apicali globosa vel late ellipsoidea, integra, 10—14 ⇌ 9—12 μ. Hyphopodia mucronata non visa. Setae myceliales numerosae, erectae, opacae, simplices, acutae, usque ad 350 ⇌ 8—10 μ, sursum late arcuatae vel subuncinatae. Perithecia dense aggregata, atra, globosa, leniter verrucosa, usque ad 220 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 44—51 ⇌ 16—19 ⇌ 12—14 μ.

Hab. in foliis *Fagraeae fragrantis,* Kuala Pilah, Malaya, Brooks *95* in Herb. Kew.

(261) **Meliola burgosensis** Hansf., sp. n. (3111, 32x3).

Plagulae hypophyllae, tenuissimae, effusae. Mycelium ex hyphis subrectis vel undulatis, atrobrunneis, 5—7 μ cr., (cellulis plerumque 30—40 μ longis), opposite vel irregulariter lateque ramosis, laxe reticulato-radiantibus compositum. Hyphopodia capitata alternata, recta vel curvata, 25—35 μ longa, cellula basali cylindracea, 7—13 μ longa,

cellula apicali oblonga, apice rotundata, integra vel varie lobata, recta vel curvata, 15—23 ⇌ 9—13 μ. Hyphopodia mucronata illis capitatis commixta, alternata vel opposita, ampullacea, recta vel curvata, 20—25 ⇌ 6—9 μ, collo elongato, 3 μ crasso. Setae myceliales praecique juxta perithecia evolutae, erectae, rectae, simplices, acutae, usque ad 800 ⇌ 9—11 μ. Perithecia laxe dispersa, atra, globosa, verrucosa, immatura. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, 36 ⇌ 13 μ.

Hab. in foliis *Bauhiniae* spec., Burgos, Luzon, Philippines, Phil. Bur. Sci. 27801 p. p.

This occurs mixed with *M. bauhiniae* Yates; very few spores were found in the specimen examined, which contained no mature perithecia.

(262) **Meliola carludovicae** Hansf., sp. n. ($31^1/_3$3. 5332)

Plagulae epiphyllae, densae, 1—4 mm. diam., vel confluentes. Mycelium ex hyphis atrobrunneis, subrectis, 7—9 μ cr. (cellulis plerumque 20—30 μ longis), opposite lateque ramosis, dense reticulatis compositum, subsolidum. Hyphopodia capitata opposita vel alternata, antrorsa, 15—24 μ longa, cellula basali cylindracea, 3—7 μ longa, cellula apicali ovata vel cylindracea, 3—7 μ longa, cellula apicali ovata vel cylindracea, apice rotundata, 10—16⇌ 8—11 μ. Hyphopodia mucronata pauca, illis capitatis commixta, opposita vel alternata, ampullacea, 15—22 ⇌ 7—10 μ. Setae myceliales sparse dispersae, erectae, rectae, simplices et acutae, vel apice 2—3-dentatae (— 8 μ), usque ad 400 ⇌ 10—12 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 240 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 45—52 ⇌ 17—20 μ.

Hab. in foliis *Carludovicae* spec., Rio de Janeiro, Brazil, U l e 2231 in Herb. Stockholm.

This specimen was originally determined by R e h m as *M. bidentata* Cooke.

(263) **Meliola casearlae-guianensis** Hansf., sp. n. (3113. 4223).

Syn.: *M. ambigua* Pat. & Gaill., var. *caseariaecola* Cif., Mycopathologia **7**: 93. 1954.

Plagulae epiphyllae, atrae, tenues, 1—3 mm. diam., subinde confluentes. Mycelium ex hyphis atrobrunneis, subrectis vel leniter undulatis, 7—8 μ cr. (cellulis plerumque 20—30 μ longis), opposite vel irregulariter lateque ramosis, laxe reticulatis compositum. Hyphopodia capitata alternata vel circa 1% opposita, recta vel curvula, antrorsa, 18—25 μ longa, cellula basali cuneata, 4—9 μ longa, cellula apicali clavata vel subglobosa, integra, apice late rotundata, recta vel curvula, 12—16 ⇌ 10—13 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 15—25 ⇌ 7—9 μ, collo elongato, suberecto, 3—4 μ cr. Setae myceliales tenuiter dispersae, etiam

juxta perithecia aggregatae, erectae, rectae, simplices, acutae vel subacutae 360—560 ⇌ 8—9 μ. Perithecia laxe gregaria, atra, globosa, leniter verrucosa, 160—200 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 40—46 ⇌ 15—18 μ.

Hab. in foliis *Casearíae guianensis,* San Domingo, Ciferri 2776 in Herb. Stockholm.

Ciferri, l. c., gives the perithecia as reaching 250 μ diam., and the setae as up to 1000 μ long. The same species occurs in Stevens 7688 on *C. ramiflora,* Manati, Porto Rico; it differs from *M. casearíae* in smaller hyphopodia and spores.

(264) **Meliola catherinensis** Hansf., sp. n. (3113. 3221).

Plagulae epiphyllae, usque ad 1 mm. diam., subtenues, Mycelium ex hyphis atrobrunneis, undulatis vel flexuosis, 6—7 μ cr. (cellulis plerumque 15—20 μ longis), opposite vel irregulariter ramosis, laxe reticulatis compositum. Hyphopodia capitata alternata vel opposita, patentia, recta vel curvata, 11—15 μ longa, cellula basali cylindracea, 3—4 μ longa, cellula apicali globosa vel late piriforme, integra, 8—11 ⇌ 8—10 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, curvata, 14—18 ⇌ 7—9 μ, collo 3—4 μ cr. Setae myceliales dispersae, etiam juxta perithecia aggregatae, erectae, rectae, simplices, acutae, usque ad 230 ⇌ 8—9 μ. Perithecia in centro plagularum laxe aggregata, atra, globosa, verrucosa, usque ad 190 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 34—38 ⇌ 13 μ.

Hab. in foliis *Aristolochiae triangularis,* Santa Catharina, Brazil, Ule, Herb. brasil. 971, p. p.

(265) **Meliola cibaoensis** Hansf., sp. n. (3113. 4223).

Plagulae epiphyllae, tenues, effusae, saepe confluentes, indeterminatae. Mycelium laxe reticulatum, ex hyphis atrobrunneis, subrectis, 6—7 μ cr. (cellulis plerumque 20—40 μ longis), opposite acuteque ramosis compositum. Hyphopodia capitata alternata vel usque ad 1% opposita, recta vel curvata, 15—23 μ longa, cellula basali cylindracea, 3—7 μ longa, cellula apicali ex subglobosa cylindracea, apice rotundata, integra vel subglobata, 11—19 ⇌ 8—12 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 15—23 ⇌ 7—9 μ, collo 3—4 μ cr. Setae myceliales praecipue juxta perithecia, erectae, rectae, raro curvulae, simplices, acutae, usque at 800 ⇌ 9—11 μ. Perithecia laxe dispersa, atra, globosa, verrucosa, usque ad 180 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 34—42 ⇌ 14—17 ⇌ 12—14 μ.

Hab. in foliis *Byrsonimae* spec. indet., San Domingo, Ciferri, Mycofl. Doming. exs. 46-ter, socio *Meliola byrsonimae* Stev.

(266) *Meliola circinans* Earle, var **rhynchosporae** Hansf. var. n. (3411. 3223)

Plagulae amphigenae, usque ad 1 mm. diam. vel confluentes, subtenues. Mycelium ex hyphis subrectis vel undulatis, atrobrunneis, 5—7 μ cr. (cellulis plerumque 20—25 μ longis) alternatim ramosis, laxe reticulatis compositum. Hyphopodia capitata alternata, plus minusve antrorsa, recta vel curvata, 16—25 μ longa, cellula basali cylindracea, 5—10 μ longa, cellula apicali curvato-cylindracea, apice rotundata, vel irregulariter rotundato-angulosa, 11—17 ⇌ 7—15 μ, versiforme. Hyphopodia mucronata pauca, illis capitatis commixta, alternata, raro opposita, ampullacea, 17—20 ⇌ 7—9 μ. Setae myceliales dispersae, erectae, rectae, simplices, acutae, usque ad 600 ⇌ 7—9 μ. Perithecia sparsa, atra, globosa, verrucosa, usque ad 160 μ diam., superne setis 0—4, erectis, incurvatis, simplicibus, acutis, usque ad 120 ⇌ 6—7 μ, ornata. Sporae atrobrunneae, cylindraceae utrinque apiculatae, 4-septatae, constrictae, 32—41 ⇌ 13—15 μ.

Hab. in foliis *Rhynchosporae dodecandrae,* Eustis, Lake Co., Florida, Nash. Plants of Florida 1803, in Herb. Kew and Herb. Stockholm.

(267) **Meliola coccolobis-nodosae** Hansf., sp. n. (3113. 5222).

Plagulae epiphyllae, densae, velutinae, usque ad 2 mm. diam. vel confluentes. Mycelium ex hyphis atrobrunneis, subrectis vel leniter undulatis, 7—9 μ cr. (cellulis plerumque 20—25 μ longis), opposite ramosis, dense reticulatis compositum. Hyphopodia capitata alternata vel rarissime opposita, plus minusve antrorsa, recta, 15—20 μ longa, cellula basali cuneata vel cylindracea, 2—6 μ longa, cellula apicali subglobosa vel late piriforme, integra, 10—14 ⇌ 10—16 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 13—20 ⇌ 8—10 μ, collo erecto, 3 μ cr. Setae myceliales numerosae, dispersae, erectae, rectae, simplices, acutae, usque ad 500 ⇌ 8—10 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 170 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 44—50 ⇌ 17—20 ⇌ 14—16 μ.

Hab. in foliis *Coccolobis nodosae,* San Domingo, Ciferri, Mycofl. Doming. exs. 257.

This was originally determined as *M. coccolobis* Stev. & Tehon, but both the spores and the hyphopodia are too large for that species.

(268) **Meliola cunoniae** Hansf., sp. n. (3111. 4233).

Plagulae amphigenae, usque ad 1.5 mm. diam., densae, subvelutinae. Mycelium ex hyphis atrobrunneis, flexuosis vel tortuosis, 7—8 μ cr. (cellulis plerumque circa 20 μ longis), alternatim vel irregulariter ramosis, dense reticulatis compositum. Hyphopodia capitata alternata, patentia, recta vel curvata, 21—32 μ long, cellula basali cylindracea,

5—12 μ longa, cellula apicali irregulariter leniter rotundato-lobata, varie curvata, elongata, 12—22 ⇌ 8—16 μ. Hyphopodia mucronata alternata, ampullacea, 15—20 ⇌ 7—10 μ, collo brevi, subrecto 3—4 μ cr. Setae myceliales numerosae, erectae, simplices, acutae, usque ad 520 ⇌ 10—12 μ. Perithecia in centro plagularum aggregata, atra, globosa, verrucosa, usque ad 280 μ diam. Sporae atrobrunneae, cylindraceae vel ellipsoideae, obtusae, 4-septatae, constrictae, 40—48 ⇌ 17—20 ⇌ 14—15 μ.

Hab. in foliis *Cunoniae capensis,* South Africa, MacOwan 1262 in Herb. Kew.

(269) *Meliola dichotoma* B. & C. in Proc. Amer. Acad. Arts & Sci. **4**: 130. 1860. (3143. 5231)

The type specimen in Herb. Kew, on *Hedera* sp., Japan, Wright 171, has the following characters: —

Colonies hypophyllous, velvety, dense, to 1.5 mm. diam. or numerous and confluent. Mycelium of substraight dark brown hyphae 6—8 μ thick, the cells mostly 16—25 μ long, branching opposite at wide angles, closely reticulate. Capitate hyphopodia about 90% opposite, somewhat antrorse, usually straight, 14—21 μ long; stalk cell cylindric, 2—6 μ long; head cell widely ovoid to piriform, entire, 10—16 ⇌ 8—11 μ. Mucronate hyphopodia few, mixed with capitate, alternate or opposite, bent ampulliform, 10—23 ⇌ 7—9 μ, neck 3 μ thick. Mycelial setae numerous, closely scattered, 180—260 μ high, 9—10 μ thick below, 1—2-dichotomous above, the branches widely divergent-reflexed, primary to 100 μ long, secondary when present to 60 μ long, apices pale and obtuse. Perithecia closely scattered, black, globose, verrucose, up to 250 μ diam. Spores dark brown, cylindric to narrowly ellipsoid, 4-septate, constricted, 44—50 ⇌ 17—19 ⇌ 12—14 μ.

The description and drawings of *M. hederae* Yamamoto, in Trans. Nat. Hist. Soc. Formosa, **31**: 53. 1941, suggest that this is a synonym of *M. dichotoma,* and this has been confirmed from a portion of the type collection in Herb. C.M.I., Kew.

(270) **Meliola didymopanacis** P. Henn., Hedwigia **34**: 106. 1895. (3123. 4221).

What appears to be a portion of the type specimen, on *Didymopanax* sp., Minas Geraes, Brazil, Glaziou, 1893, has become available to me from Herb. Stockholm, ex Herb. Sydow: —

Colonies epiphyllous, to 5 mm. diam., or numerous and widely confluent, dense, thinly velvety. Mycelium of substraight radiating hyphae, dark brown, 5—8 μ thick, the cells mostly 20—30 μ long, branching usually opposite at acute angles, closely reticulate. Capitate hyphopodia alternate or about 5% opposite, more or less antrorse, straight or bent, 16—23 μ long; stalk cell cylindric, 3—7 μ long; head

cell subglobose to ovate-piriform, entire, broadly rounded at the apex, 11—16 ⇌ 8—11 μ. Mucronate hyphopdia mixed with capitate, opposite or alternate, ampulliform, 16—23 ⇌ 7—9 μ, neck 3—4 μ thick. Mycelial setae numerous, erect, up to 300 ⇌ 8—9 μ, broadly arcuate to merely bent in upper half, simple obtuse. Perithecia scattered, black, globose, verrucose, up to 180 μ diam. Spores dark brown, cylindric, obtuse, 4-septate, constricted, 43—48 ⇌ 15—17 μ.

This specimen corresponds to another collected by *Noack* (*?no.* 669) on Didymopanax, Minas, Geraes, Brazil, now in Herb. Pretoria, ex Engler. I had previously determined this as *M. polysciatis* Hansf. This latter species is now seen to differ from *M. didymopanacis* mainly in the crooked mycelium and absence of opposite hyphopodia, which are also slightly smaller. It seems best to reduce its status to *Meliola didymopanacis* P. Henn., var. **polysciatis** Hansf. comb. n.

(271) *Meliola didymopanacis* P. Henn., var. **domingensis** Hansf., var. n. (31½3. 3221).

Plagulae epiphyllae, usque ad 5 mm diam., densae, velutinae, subinde confluentes. Mycelium ex hyphis subrectis, atrobrunneis, 6—7 μ cr. (cellulis plerumque 15—35 μ longis), opposite acuteque ramosis, dense reticulatis compositum. Hyphopodia capitata alternata vel usque ad 30% opposita, subrecta, 12—18 μ longa, cellula basali cylindracea, 2—6 μ longa, cellula apicali ovata, integra, apice rotundata vel leniter attenuata, 10—15 ⇌ 7—10 μ. Hyphopodia mucronata illis capitatis commixta, pauca, opposita vel alternata, ampullacea, 16—20 ⇌ 7—8 μ, collo erecto 3—4 μ cr. Setae myceliales numerosae, erectae, atrae, simplices, obtusae, usque ad 280 ⇌ 6—8 μ, sursum subrectae, late arcuatae vel uncinatae. Perithecia subgregaria, atra, globosa, verrucosa, usque ad 180 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 34—39 ⇌ 14—16 μ.

Hab. in foliis *Didymopanacis morototoni,* San Domingo, Ciferri, Mycofl. doming. exs. 264.

This differs from the type mainly in the unbranched setae, smaller spores and rather more pointed capitate hyphopodia, which are more often opposite.

(272) *Meliola didymopanacis* P. Henn., var. **stevensii** Hansf., var. n. (3113. 4234).

Plagulae amphigenae, plerumque hypophyllae, atrae, velutinae, usque ad 10 mm. diam., subdense. Mycelium ex hyphis subrectis, atrobrunneis, 7—9 μ cr. (cellulis plerumque 20—30 μ longis), opposite acuteque ramosis, radianto-retuculatis compositum. Hyphopodia capitata alternata vel usque ad 60% opposita, antrorsa, 12—18 μ longa; cellula basali cylindracea, 2—4 μ longa, cellula apicali subglobosa

vel ovata, integra, 10—12 ⇌ 8—11 μ. Hyphopodia mucronata illis capitatis commixta, pauca, ampullacea, plerumque unilateralia, 18—24 ⇌ 7—10 μ, collo curvato, 3—4 μ cr. Setae myceliales numerosae, erectae, rectae, simplices, acutae, usque ad 1000 ⇌ 9—12 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 210 μ diam., Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 30—45 ⇌ 14—16 μ.

Hab. in foliis *Dendropanacis arborei,* Porto Rico, S t e v e n s 7647 (in Herb. Kew and Herb. Pretoria).

The setae here are quite different from those of the type, and the capitate hyphopodia more often opposite and rather more squat in shape.

(273) *M e l i o l a d i o s p y r i* Syd., var. **leonensis** Hansf., var. n. (3112. 4223).

Ab typo ita differt: Hyphopodia capitata circa 90% opposita, antrorsa, subrecta, 14—18 μ longa, cellula basali cylindracea, 3—6 μ longa, cellula apicali ovata vel subconoidea, apice attenuato-rotundata, integra, 10—15 ⇌ 7—9 μ.

Hab. in foliis *Diospyri heudelotii,* Rokupr. Magbema, Sierra Leone, D e i g h t o n M. 1927, p. p.

(274) **Meliola ehretiae** Hansf., sp. n. (3112. 4221).

Plagulae amphigenae, plerumque hypophyllae, subtenues, numerosae et effusae. Mycelium ex hyphis atrobrunneis, subrectis vel undulatis, 5—6 μ cr. (cellulis plerumque 20—25 μ longis), opposite lateque ramosis, laxe vel subdense reticulatis compositum. Hyphopodia capitata circa 95% opposita, patentia, recta vel curvula, 12—16 μ longa, cellula basali cylindracea, 2—5 μ longa, cellula apicali cylindracea apice rotundata, integra, 9—12 ⇌ 6—8 μ. Hyphopodia mucronata illis capitatis commixta, alternata vel opposita, ampullacea 16—25 ⇌ 6—8 μ, collo elongato, 3 μ cr. Setae myceliales tenuiter dispersae, etiam juxta perithecia aggregatae, erectae, rectae, simplices, acutae vel subacutae, usque ad 230 ⇌ 6—8 μ. Perithecia laxe dispersa, atra, globosa, verrucosa, usque ad 170 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 40—47 ⇌ 15—18 μ.

Hab. in foliis *Ehretriae nunesii,* Mt. Maquiling, Los Banos, Philippines, B a k e r 94 in Herb. Stockholm ex Herb. Rehm, sub *M. cylindrophora* Rehm.

(275) *M e l i o l a f a l c a t i s e t a* Speg. var. **khasiensis** Hansf., var. n. (3123. 4222).

Plagulae hypophyllae, densissimae et subcrustosae, usque ad 2 mm diam. vel confluentes, velutinae. Mycelium ex hyphis atrobrunneis, subrectis, 8—9 μ cr. (cellulis plerumque 12—15 μ longis), opposite lateque ramosis, dense reticulatis compositum, subsolidum.

Hyphopodia capitata circa 90% opposita, leniter antrorsa, 12—18 μ longa, cellula basali cylindracea, 2—6 μ longa, cellula apicali globosa vel oblonga integra, 8—14 ⇌ 7—11 μ. Hyphopodia mucronata non visa. Setae myceliales numerosae, erectae, simplices, obtusae vel acutae, usque ad 500 ⇌ 10—12 μ, sursum arcuatae, uncinatae vel tortuosae. Perithecia aggregata, atra, globosa, verrucosa, usque ad 180 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 42—49 ⇌ 17—19 μ.

Hab. in foliis *Ilicis* spec. indet., Khasia, India, in Herb. Kew. No details are given of collector and date.

(276) **Meliola garryae** Hansf., sp. n. (3111. 3223).

Plagulae numerosae, densae, velutinae, usque ad 5 mm diam., saepe confluentes. Mycelium ex hyphis atrobrunneis, subrectis vel undulatis, 7—8 μ cr. (cellulis plerumque 20—30 μ longis), alternatim vel irregulariter ramosis, dense radianto-reticulatis compositum. Hyphopodia capitata alternata, antrorsa, recta vel curvata, 20—30 μ longa, cellula basali cylindracea, 5—15 μ longa, cellula apicali irregulariter clavata, angulosa vel leniter lobata, 15—20 ⇌ 11—16 μ. Hyphopodia muronata praecipue in hyphis distinctis evoluta, opposita vel alternata, 18—26 ⇌ 8—11 μ, ampullacea, collo elongato 3—4 μ. Setae myceliales numerosae, dispersae, erectae, rectae, simplices, acutae, usque ad 600 ⇌ 9—10 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 190 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 44—50 ⇌ 17—19 ⇌ 12—14 μ.

Hab. in foliis *Garryae* spec. indet., Texas, USA, L i n d h e i m e r 3644 in Herb. Kew.

(277) *M e l i o l a g e n i c u l a t a* Syd. & Butl., var. **minor** Hansf. var. n. (3133. 3221).

Plagulae amphigenae plerumque epiphyllae, atrae, subdensae, tenuiter velutinae, usque ad 3 mm diam., vel numerosae et confluentes. Mycelium dense reticulatum, ex hyphis atrobrunneis, subrectis, 6—7 μ cr. (cellulis plerumque 15—25 μ longis), opposite ramosis compositum. Hyphopodia capitata alternata vel usque ad 2% opposita, recta vel curvata, 12—16 μ longa, cellula basali cylindracea, 2—5 μ longa, cellula apicali cylindracea vel piriforme, apice late rotundata, integra, 9—12 ⇌ 8—10 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea 12—17 ⇌ 7—9 μ, collo brevi, 3—4 μ cr. Setae myceliales dispersae etiam juxta perithecia aggregatae, erectae, rectae, usque ad 280 ⇌ 7—9 μ, apice 2—4-dentatae (— 10μ). Perithecia sparsa, atra, globosa, verrucosa, usque ad 150 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae 29—35 ⇌ 12—14 ⇌ 11—12 μ.

Hab. in foliis *Anacardiacearum* spec. indet., Tarapoto, Peru, U l e, Herb. brasil. 3264 in Herb. Kew.

(278) *Meliola groteana* Syd. var. **ardisiicola** Hansf., var. n (3113. 4222).

Plagulae epiphyllae, in maculas rubidas, tenues vel densae, usque ad 4 mm diam. vel confluentes. Mycelium ex hyphis subrectis, atrobrunneis, 6—7 μ cr. (cellulis plerumque circa 25 μ longis), opposite ramosis, dense reticulatis compositum. Hyphopodia capitata opposita vel alternata, patentia, recta, 9—13 μ longa, cellula basali cylindracea, 2—4 μ longa, cellula apicali globosa, integra, 8—11 μ diam. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 12—16 ⇌ 7—9 μ, collo elongato, 3 μ cr. Setae myceliales numerosae, erectae, rectae, simplices, acutae, usque ad 330 ⇌ 9—11 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 190 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 35—42 ⇌ 13—14 ⇌ 11—12 μ.

Hab. in foliis *Ardisiae perrottetianae,* Mt. Maquilling, Los Banos, Philippines, Baker 254 in Herb. Kew.

(279) *Meliola kibirae* Hansf. & Stev., var. **domingensis** Hansf., var. n. (3111. 3223).

Plagulae epiphyllae, tenues, usque ad 2 mm diam., vel confluentes. Mycelium ex hyphis atrobrunneis, subrectis, 6—7 μ cr. (cellulis plerumque 20—30 μ longis), opposite ramosis, laxe reticulatis compositum. Hyphopodia capitata alternata, patentia, 17—25 μ longa, cellula basali cylindracea, 5—10 μ longa, cellula apicali oblonga vel ovata, apice late rotundata, 11—16 ⇌ 9—11 μ. Hyphopodia mucronata pauca, illis capitatis commixta, opposita vel alternata, ampullacea, 15—22 ⇌ 7—9 μ, collo suberecto, 3—4 μ cr. Setae myceliales tenuiter dispersae, erectae, rectae, simplices, acutae, usque ad 550 ⇌ 7—9 μ. Perithecia sparsa, atra, globosa, verrucosa, usque ad 160 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 32—38 ⇌ 13—15 ⇌ 11—12 μ.

Hab. in foliis *Guettardae pungentis,* San Domingo, Ciferri, Mycofl. doming. exs. 43 (typus in Herb. Kew).

This was originally determined as *M. seminata* B. & C.

(280) **Meliola kigeliae** Hansf., sp. n. (3131. 5222).

Plagulae hypophyllae, densae, velutinae, usque ad 3 mm diam., vel numerosae et confluentes. Mycelium ex hyphis atrobrunneis, undulatis vel tortuosis, 7—8 μ cr. (cellulis plerumque 30—40 μ longis), opposite vel irregulariter ramosis, dense reticulatis compositum. Hyphopodia capitata alternata, recta vel curvata, 20—33 μ longa, cellula basali cylindracea, 4—13 μ longa, cellula apicali cylindracea vel clavulata, apice late routundata, integra, recta vel curvata, 15—21 ⇌ 8—11 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 18—24 ⇌ 7—9 μ, collo suberecto, 3 μ cr. Setae

myceliales numerosae, dispersae, etiam juxta perithecia aggregatae, erectae, rectae, 280—480 ⇌ 7—9 μ, apice 2—4-dentatae, usque ad 17 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 170 μ diam. Sporae atrobrunneae, cylindraceae vel subellipsoideae, obtusae, 4-septatae, constrictae, 44—51 ⇌ 16—18 ⇌ 13—15 μ.

Hab. in foliis *Kigeliae moosae,* Kyalama, Uganda, D u m m e r, 2829 in Herb. Kew.

Many spores are slightly wider towards one end.

(281) *M e l i o l a l o n g i s t i p i t a t a* Stev. var. **wakefieldii** Hansf. var. n. (3132. 3222).

Plagulae amphigenae, usque ad 6 mm diam., densae, velutinae. Mycelium ex hyphis atrobrunneis, subrectis vel undulatis, 5—7 μ cr. (cellulis plerumque circa 20 μ longis), opposite lateque ramosis, dense reticulatis compositum. Hyphopodia capitata opposita, recta vel curvata, 10—14 μ longa, cellula basali cylindracea, 2—4 μ longa, cellula apicali globosa vel ovata, integra, 7—10 ⇌ 7—10 μ. Hyphopodia mucronata pauca, illis capitatis commixta, ampullacea, 12—15 ⇌ 7—8 μ, collo suberecto, 3 μ cr. Setae myceliales tenuiter dispersae, etiam juxta perithecia aggregatae, erectae, rectae, usque ad 500 ⇌ 7—9 μ, apice 3—5-dentatae (—8 μ) vel 2-furcatae (—15 μ), ramulis dentatis. Perithecia dispersa, atra, globosa, verrucosa, usque ad 140 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 28—34 ⇌ 9—11 μ.

Hab. in foliis *Costi* spec. indet., Trinidad, W a k e f i e l d 204 in Herb. Kew.

The capitate hyphopodia are without the long stalk cells described for the type, but this is considered to be probably related to the configuration of the host cuticle.

(282) **Meliola malpighiacearum** Hansf., sp. n. (3131. 3221).

Plagulae amphigenae, tenues, 1 mm diam. vel confluentes. Mycelium ex hyphis atrobrunneis, undulatis 5—7 μ cr. (cellulis plerumque 25—40 μ longis), opposite lateque ramosis, laxe reticulatis compositum. Hyphopodia capitata alternata, antrorsa, 16—27 μ longa, cellula basali cuneata vel cylindracea, 3—10 μ longa, cellula apicali ovata vel subcylindracea, integra, 12—18 ⇌ 9—12 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 15—20 ⇌ 7—8 μ, collo 3 μ cr. Setae myceliales praecipue juxta perithecia evolutae, erectae, incurvatae vel rectae, usque ad 250 ⇌ 7—8 μ, apice obtusae vel 2—3-dentatae (—6 μ), raro furcatae (—15 μ). Perithecia dispersa, atra, globosa, verrucosa, usque ad 170 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 31—38 ⇌ 13—14 ⇌ 11—13 μ.

Hab. in foliis *Malpighiacearum* spec. indet., Pedras Grandes, Brazil, U l e 1835 in Herb. Stockholm, ex Herb. Rehm, sub *M. bidentata* Cke.

(283) **Meliola mauritiana** Hansf., sp. n. (3113. 5334).

Plagulae hypophyllae, densae, velutinae, usque ad 6 mm diam. vel late confluentes. Mycelium ex hyphis atrobrunneis, subrectis, 9—10 μ cr. (cellulis plerumque 20 μ longis), opposite lateque ramosis, dense reticulatis compositum. Hyphopodia capitata alternata, raro etiam opposita, recta vel curvata, 25—35 μ longa, cellula basali cylindracea, 5—11 μ longa, cellula apicali ovata, cylindracea vel late piriforme, integra vel lenissime rotundato-angulosa 19—24 ⇌ 11—14 μ. Hyphopodia mucronata illis capitatis commixta, ampullacea, 19—26 ⇌ 9—11 μ, collo 4 μ cr. Setae myceliales numerosae, erectae, rectae, simplices, acutae, usque ad 1100 ⇌ 13—15 μ. Perithecia dispersa, atra, globosa, verrucosa usque ad 230 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 52—59 ⇌ 22—25 μ.

Hab. in foliis *Antidesmae* (? *rotundifoliae*), Mauritius, no. 12, in Herb. Kew.

(284) **Meliola mimosacearum** Hansf. sp. n. (3131. 3221).

Plagulae plerumque epiphyllae, tenues vel densae, usque ad 1 mm diam. Mycelium ex hyphis atrobrunneis, subrectis, 6—7 μ cr. (cellulis plerumque 20—25 μ longis), opposite acuteque ramosis, subdense reticulatis compositum. Hyphopodia capitata alternata, plus minusve antrorsa, recta vel curvata, 14—20 μ longa, cellula basali cylindracea, 3—6 μ longa, cellula apicali globosa vel oblonga, integra, 11—13 ⇌ 9—13 μ. Hyphopodia mucronata in hyphis distinctis evoluta, alternata vel opposita, ampullacea, 12—16 ⇌ 7—8 μ, collo 3 μ cr. Setae myceliales praecipue juxta perithecia evolutae, erectae, rectae, usque ad 230 ⇌ 7—9 μ, apice 2—3-dentatae vel breviter furcatae, usque ad 18 μ. Perithecia gregaria, atra, globosa, verrucosa, usque ad 195 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 31—37 ⇌ 12—13 ⇌ 10—11 μ.

Hab. in foliis *Mimosacearum* spec. indet., Brazil, U l e 1840 in Herb. Stockholm, det. Rehm sub *Meliola denticulata* Wint.

(286) **Meliola pauciseta** Hansf., sp. n. ($31^1/_3$. 3222).

Plagulae epiphyllae, tenues, usque ad 2 mm diam. Mycelium ex hyphis atrobrunneis, 6—7 μ cr., undulatis, cellulis plerumque 15—25 μ longis, opposite lateque ramosis subdense reticulatis compositum. Hyphopodia capitata alternata vel usque ad 2% opposita, antrorsa, 12—19 μ longa, cellula basali cylindracea, 2—6 μ longa, cellula apicali late ovata vel oblonga, integra, 9—14 ⇌ 7—10 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 13—19 ⇌ 7—9 μ, collo suberecto, 3—4 μ cr. Setae myceliales dispersae,

erectae, rectae, simplices, apice acutae, vel 2-dentatae (—12 μ), usque ad 350 ⇌ 8—9 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 150 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 29—35 ⇌ 13—14 μ.

Hab. in foliis *Solani* spec. indet., Rio de Janeiro, Brazil, U l e, Herb. brasil. 2386, in Herb. Stockholm ex Herb. R e h m, sub *Meliola fuscidula* Gaill.

(287) **Meliola perae** Hansf., sp. n. (3111. 4231).

Plagulae amphigenae, plerumque hypophyllae, tenues, usque ad 2 mm diam. vel confluentes. Mycelium ex hyphis atrobrunneis, subrectis, 7—8 μ cr. (cellulis plerumque 20—30 μ longis), opposite acuteque ramosis, laxe reticulatis compositum. Hyphopodia capitata alternata, antrorsa, recta, 15—22 μ longa, cellula basali cylindracea, 3—10 μ longa, cellula apicali oblonga, apice rotundata, 11—15 ⇌ 8—10 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 12—19 ⇌ 7—9 μ. Setae myceliales juxta perithecia evolutae, subrectae, simplices obtusae vel acutae, usque ad 280 ⇌ 8—9 μ. Perithecia in centro plagularum laxe gregaria, atra, globosa, verrucosa, usque ad 220 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 40—46 ⇌ 15—16 μ.

Hab. in foliis *Perae leandri,* Rio de Janeiro, Brazil, U l e, Herb. brasil. 2541, in Herb. Kew.

(288) **Meliola philodendricola** Hansf., sp. n. (3123. 4221).

Plagulae amphigenae, usque ad 3 mm diam., subdensae velutinae. Mycelium ex hyphis atrobrunneis, subrectis, 5—7 μ cr. (cellulis plerumque 20—30 μ longis), opposite acuteque ramosis, subdense radianto-reticulatis compositum. Hyphopodia capitata alternata vel opposita, patentia, 14—20 μ longa, cellula basali cylindracea, 2—6 μ longa, cellula apicali subglobosa vel oblonga, integra, 11—15 ⇌ 9—12 μ. Hyphopodia mucronata pauca, illis capitatis commixta, alternata vel opposita, ampullacea, 13—25 ⇌ 8—10 μ, collo 3—4 μ cr. Setae myceliales numerosae, dispersae, erectae, simplices, obtusae vel subacutae, usque ad 290 ⇌ 7—9 μ, sursum late arcuatae vel hamatae. Perithecia dispersa, atra, globosa, verrucosa, usque ad 190 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 37—45 ⇌ 14—16 μ.

Hab. in foliis *Philodendri* spec. indet., Pedras Grandes, Santa Catharina, Brazil, 1891, U l e, Herb. brasil. 1753 in Herb. Kew.

(289) **Meliola picrasmae** Hansf., sp. n. ($31^3/_4$3. 4222).

Plagulae hypophyllae, illis *Asterinae lobatae* Syd. commixtae, densae, velutinae, usque ad 2 mm diam. vel confluentes, raro etiam epiphyllae minores. Mycelium ex hyphis atrobrunneis, subrectis vel undulatis, 6—8 μ cr. (cellulis plerumque 25—35 μ longis), opposite

lateque ramosis, dense reticulatis compositum. Hyphopodia capitata alternata vel circa 20% opposita, patentia, recta vel curvata, 14—25 μ longa, cellula basali cylindracea, 3—7 μ longa, cellula apicali cylindracea apice rotundata, recta vel curvata, 12—18 ⇌ 7—9 μ, Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 20—24 ⇌ 7—9 μ, collo 3—4 μ cr. Setae myceliales numerosae, dispersae, erectae, subrectae, usque ad 450 ⇌ 7—9 μ, apice 2—4-dentatae (—15 μ) vel breviter reflexo-2-furcatae, ramulis 2-dentatis. Perithecia dispersa, atra, globosa, verrucosa, usque ad 185 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 40—46 ⇌ 15—16 ⇌ 12—13 μ.

Hab. in foliis *Picrasmae javanicae,* Mt. Apo, Davao, Mindanao, Philippines, E l m e r, Phil. Bur. Sci. 10842 p. p.

(290) **Meliola pictetiae** Hansf., sp. n. (3113. 4223).

Plagulae amphigenae, usque ad 3 mm diam., subdensae, tenuiter velutinae. Mycelium ex hyphis atrobrunneis, subrectis, 6—7 μ cr. (cellulis plerumque 15—25 μ longis), opposite acuteque ramosis, laxe vel subdense reticulatis compositum. Hyphopodia capitata alternata vel opposita, leniter antrorsa, recta, 15—19 μ longa, cellula basali cylindracea, 3—6 μ longa, cellula apicali subglobosa, ovata vel late piriforme, integra, 10—14 ⇌ 8—10 μ. Hyphopodia mucronata pauca, illis capitatis commixta, opposita vel alternata, ampullacea, 15—20 ⇌ 8—11 μ, collo 3 μ cr. Setae myceliales laxe dispersae, etiam juxta perithecia aggregatae, subrectae, simplices, acutae, usque ad 600 ⇌ 9—10 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 190 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae 36—45 ⇌ 17—19 ⇌ 13—15 μ.

Hab. in foliis *Pictetiae spinifoliae,* San Domingo, C i f e r r i, Mycofl. doming. exs. 188 (typus in Herb. Kew).

This was originally determined as *M. abrupta* Syd.; it is close to *M. ostryoderridis* Hansf. & Deight., but differs in its longer setae and wider spores.

(291) **Meliola pittospori** Hansf., sp. n. (3113. 5221).

Plagulae amphigenae, densae, velutinae, usque ad 4 mm diam. vel confluentes. Mycelium ex hyphis atrobrunneis, subrectis, 7—8 μ cr. (cellulis plerumque 15—20 μ longis), opposite acuteque ramosis, dense reticulatis compositum, subsolidum. Hyphopodia capitata opposita vel alternata, antrorsa, recta vel curvata, 14—20 μ longa, cellula basali cylindracea, 2—6 μ lono, cellula apicali globosa vel ovata, integra, 12—16 ⇌ 9—14 μ. Hyphopodia mucronata non visa. Setae myceliales numerosae, erectae, rectae, simplices, acutae, usque ad 300 ⇌ 8—10 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 160 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 47—54 ⇌ 17—18 μ.

Hab. in foliis *Pittospori senaciae,* Mauritius, typus in Herb. Kew.

(292) **Meliola pseudocapensis** Hansf., sp. n. ($31^1/_3 2$. 4223).

Plagulae epiphyllae, numerosae, subtenues, usque ad 3 mm diam., vel confluentes, tenuiter velutinae. Mycelium ex hyphis atrobrunneis, subrectis, 7—8 μ cr. (cellulis plerumque 20—30 μ longis), opposite ramosis, laxe reticulatis compositum. Hyphopodia capitata opposita, patentia, 15—21 μ longa, cellula basali cylindracea, 2—5 μ longa, cellula apicali cylindracea, apice rotundata vel lenissime attenuata, recta vel curvata, 11—15 ⇌ 8—11 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 15—22 ⇌ 8—9 μ, collo 3 μ cr. Setae myceliales dispersae, etiam juxta perithecia aggregatae, rectae, usque ad 800 ⇌ 11—13 μ, apice acutae vel 2—3-dentatae usque ad 5 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 180 μ diam. Sporae atrobrunneae, ellipsoideae, obtusae, 4-septatae, constrictae, 38—45 ⇌ 17—20 μ.

Hab. in foliis ?*Aegiphilae* spec. indet., Jurua, Brazil, U l e, Append. Mycoth. Brasil. 17.

This resembles *M. capensis* (K. & C.) Theiss., but the capitate hyphopodia are considerably larger and the setae longer.

(293) **Meliola regiae** Hansf., sp. n. ($31^1/_3 1$. 4332).

Plagulae hypophyllae, tenues, usque ad 3 mm diam. Mycelium ex hyphis atrobrunneis, subrectis vel leniter undulatis, 7—8 μ cr. (cellulis plerumque 20—30 μ longis), opposite vel irregulariter lateque ramosis, laxe reticulatis compositum. Hyphopodia capitata alternata, patentia, recta vel curvata, 18—29 μ longa, cellula basali cylindracea, 5—12 μ longa, cellula apicali irregulariter clavata, angulosa vel sublobata, saepe curvata, 12—18 ⇌ 11—15 μ. Hyphopodia mucronata in hyphis distinctis evoluta, opposita vel alternata, ampullacea, 15—20 ⇌ 7—9 μ, collo brevi, 3—4 μ cr. Setae myceliales tenuiter dispersae, etiam juxta perithecia aggregatae, rectae, simplices, obtusae, vel raro 2-dentatae (—4 μ), usque ad 400 ⇌ 8—9 μ, sursum scabridae. Perithecia dispersa, atra, globosa, verrucosa, usque ad 220 μ diam. Sporae atrobrunneae, cylindraceae vel ellipsoideae, obtusae, 4-septatae, constrictae, 40—49 ⇌ 18—22 ⇌ 14—16 μ.

Hab. in foliis *Oreodoxae regiae,* San Domingo, C i f e r r i, Mycofl. doming. exs. 247.

Towards the apex the setae are scabrid with small cylindrical projections up to 3 μ high.

(294) *Meliola rhois* P. Henn. var. *flexuosiseta* (Speg.) Hansf., Arq. Inst. Biol. Sao Paulo, **12**: 242. 1941.

I have examined the type of *M. cookeana* Speg. forma *duvauae* Sacc. & Syd., in Herb. Stockholm, ex Herb. S y d o w, on *Duvaua*

dependens, Chile, N e g e r, July 1891, and find it to be inseparable from the above.

(295) **Meliola rickiana** Hansf., sp. n. (3123. 5332).

Plagulae amphigenae et petiolicolae, densae, usque ad 2 mm diam., velutinae. Mycelium ex hyphis atrobrunneis, subrectis, 6—8 μ cr. (cellulis plerumque 20—30 μ longis, opposite lateque ramosis, dense reticulatis compositum. Hyphopodia capitata alternata vel circa 3% opposita, antrorsa, subrecta, 15—19 μ longa, cellula basali cylindravea, 3—5 μ longa, cellula apicali subglobosa, ovata vel cylindracea, apice rotundata, integra, 10—14 ⇌ 8—11 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 15—20 ⇌ 7—9 μ, collo 3 μ cr. Setae myceliales numerosae, dispersae etiam juxta perithecia aggregatae, erectae, atrae, late arcuatae vel uncinatae, usque ad 350 ⇌ 10—12 μ, apice acutae vel raro minute 2-dentatae (—3 μ). Perithecia dispersa, atra globosa, verrucosa, usque ad 220 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 46—53 ⇌ 18—21 ⇌ 15—16 μ.

Hab. in foliis *Xanthoxyli* spec. indet., Sao Leopoldo, Rio Grande do Sul, Brazil, R i c k 35, in Herb. Stockholm.

(296) **Meliola sclerolobii** Hansf., sp. n. (3131. 5221).

Plagulae epiphyllae, raro etiam hypophyllae, numerosae sed raro confluentes, usque ad 5 mm diam., densae, velutinae. Mycelium ex hyphis atrobrunneis, subrectis vel leniter undulatis, 7—9 μ cr., (cellulis plerumque 15—25 μ longis), opposite acuteque ramosis, dense reticulatis compositum. Hyphopodia capitata alternata, antrorsa vel patentia, recta vel curvata, 17—22 μ longa, cellula basali cylindracea, 3—7 μ longa, cellula apicali globosa vel late piriforme, integra, 12—16 ⇌ 11—14 μ. Hyphopodia mucronata in hyphis distinctis evoluta, opposita vel alternata, ampullacea, 15—20 ⇌ 7—9 μ, collo 3 μ cr. Setae myceliales numerosae, dispersae, etiam juxta perithecia aggregatae, erectae, rectae, usque ad 290 ⇌ 8—9 μ, apice breviter 2—5-furcatae (—25 μ), ramulis varie plurie dentatis usque ad 15 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 210 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 45—52 ⇌ 17—19 ⇌ 14—15 μ.

Hab. in foliis *Sclerolobii* spec. indet., Tarapoto, Rio Huallega, Peru, U l e, s. n., in Herb. Stockholm, ex Herb. Sydow.

This specimen was originally determined by H e n n i n g s as *M. denticulata* Wint., and reported as such in Hedwigia 44: 57. 1905.

(297) **Meliola sparsipoda** Hansf., sp. n. (3111. 6332).

Plagulae hypophyllae, tenues, usque ad 35 ⇌ 15 mm. Mycelium ex hyphis atrobrunneis, subrectis vel undulatis, 7—8 μ cr. (cellulis plerumque 30—50 μ longis), opposite vel irregulariter ramosis, laxe

reticulatis compositum, dein intertextum et densum. Hyphopodia capitata laxe dispersa, alternata vel unilateralia, saepe irregulariter curvata, 30—40 μ longa, cellula basali cuneata vel cylindracea, curvata, 10—25 μ longa, sursum 9—15 μ cr., cellula apicali subglobosa, angulosa vel irregulariter lobata, versiforme, saepe curvata, 20—25 ⇌ 14—23 μ. Hyphopodia mucronata in hyphis distinctis evoluta, dispersa, opposita vel saepe alternata, ampullacea, 18—25 ⇌ 7—8 μ, collo elongato, 3 μ cr. Setae myceliales dispersae, etiam juxta perithecia aggregatae, erectae, subrectae, simplices, acutae, usque ad 350 ⇌ 8—10 μ. Perithecia sparsa, atra, globosa, verrucosa, usque ad 240 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 55—64 ⇌ 20—25 ⇌ 15—18 μ.

Hab. in foliis *Palmarum* spec. indet., Kartabo, British Guiana, Stevens, Fungi of B. Guiana 367, typus in Herb. Farlow.

The colonies are normally thinly velvety, but most are parasitised by *Helminthosporium*, and then are covered with a felt of conidiophores of this parasite.

(298) **Meliola tridentata** Hansf., sp. n. (3133. 4232).

Plagulae amphigenae, densae, crustosae, 1—2 mm diam. vel confluentes, facile secedentes, velutinae. Mycelium ex hyphis atrobrunneis, subrectis, 6—9 μ cr. (cellulis plerumque 20—30 μ longis), opposite lateque ramosis, dense reticulato-intertextis compositum. Hyphopodia capitata alternata vel opposita, recta vel curvata, antrorsa vel patentia. 13—18 μ longa, cellula basali cylidracea, 3—5 μ longa, cellula apicali subglobosa vel clavulato-cylindracea, integra, 10—13 ⇌ 8—11 μ. Hyphopodia mucronata pauca, illis capitatis commixta, opposita vel alternata, ampullacea, 14—20 ⇌ 6—9 μ, collo 3 μ cr. Setae myceliales numerosae, erectae, atrae, usque ad 330 ⇌ 9—11 μ, apice raro acutae, saepius 3-dentatae usque ad 18 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 225 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 40—48 ⇌ 16—18 ⇌ 14—15 μ.

Hab. in foliis *Scutiae arcnicolae,* Rio de Janeiro, Brazil, Ule 2263 in Herb. Stockholm.

(299) **Meliola viburnicola** Hansf., sp. n. (3112. 5222).

Plagulae amphigenae, subdensae, velutinae, usque ad 5 mm diam. vel confluentes. Mycelium ex hyphis atrobrunneis subrectis vel undulatis, 5—6 μ cr. (cellulis plerumque circa 20 μ longis), opposite lateque ramosis, subdense reticulatis compositum. Hyphopodia capitata opposita, recta vel curvata, patentia, 12—16 μ longa, cellula basali cylindracea, 2—5 μ longa, cellula apicali oblonga apice rotundata, vel lenissime rotundato-angulosa, recta vel curvata, 10—13 ⇌ 6—9 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alter-

nata, ampullacea, 13—20 ⇌ 6—9 μ, collo suberecto, 3 μ cr. Setae myceliales paucae vel numerosae, erectae, rectae, simplices, acutae, usque ad 400 ⇌ 7—9 μ. Perithecia sparsa, atra, globosa, verrucosa, usque ad 170 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 44—51 ⇌ 16—19 μ.

Hab. in foliis *Viburni odoratissimi,* Luzon, Philippines, Phil. Bur. Sci. 4960 in Herb. Kew.

On the lower surface of the leaf the mycelium is much more crooked, with many alternate hyphopodia, more variable in size and shape and more angulose.

(300) *Meliola zig-zac* B. & C., Journ. Linn. Soc. London, 10: 392. 1869.

A number of specimens dating from the time of the original description are held at Kew under this name, but the only „zig-zag" character common to them is that of the conidiophores of the parasitic *Helminthosporium*! The type is Wright 882, Cuba, on an unknown host, and the same fungus and host are also represented by Wright 478, also from Cuba.

Colonies hypophyllous, to 15 mm diam. or confluent, rather thin, thinly verlvety. Mycelium of substraight dark brown hyphae 6—7 μ thick, the cells mostly 15—25 μ long, branching usually opposite at acute angles, closely radiating-reticulate. Capitate hyphopodia opposite or up to 50% alternate, more or less antrorse, usually straight, 12—16 μ long; stalk cell cylindric, 2—5 μ long; head cell globose, regular, 9—12 μ diam. Mucronate hyphopodia mixed with capitate, opposite or alternate, bent ampulliform, 18—24 μ long, 7—10 μ thick, the neck upturned, 3 μ thick. Mycelial setae thinly scattered, black, erect, straight, simple, acute, up to 1100 ⇌ 9—11 μ. Perithecia scattered, black, globose, verrucose, up to 210 μ diam. Spores dark brown, cylindric, obtuse, 4-septate, constricted, 38—44 ⇌ 15—17 μ.

The Beeli formula is therefore 3113. 4234.

Hitherto I have been unable to match these collections with any more recent ones from any part of the world

(301) **Amazonia piperis** (Syd.) Hansf., comb. n. (3101. 4230).

Syn.: *Actinodothis piperis* Syd., Phil. Journ. Sci., C., Bot., **9**: 174. 1914; Theissen & Sydow, Ann. Myc., **13**: 254. 1915.

Colonies epiphyllous, sometimes also hypophyllous, scattered, superficial, black, smooth, dense, 1.5—3 mm diam., discoid, closely adherent. Mycelium almost a solid plate of radiating dark brown hpyhae 7—9 μ thick, the cells mostly 9—20 μ long, closely and irregularly branched. Capitate hyphopodia in mature colonies scarcely recognisable due to compression between the hyphae, save by the presence of a pore in the lower surface of the head cells; in younger colonies alternate, closely antrorse, 11—18 μ long, usually straight;

stalk cell cuneate-cylindric, 2—7 μ long; head cell globose to ellipsoid, entire, 9—13 ⇌ 7—11 μ. Mucronate hyphopodia not seen. Ascomata few in each colony, developing beneath the mycelial layer and remaining covered by its radiate structure, flattened conic, black, smooth, up to 250 μ diam. and 150 μ high in the centre; with several layers of dark brown parenchyma below the mycelial layer on the upper side, on the lower side the wall very thin and often of only one layer of lighter brown parenchyma, surrounding the fibrous, hyaline soft „nucleus", in the base of which the asci develop. The hyphae of the „nucleus" are attached all round the wall of the stroma, which eventually opens at the apex by a central pore lined with short pale brown periphyses, and appearing from the exterior as an irregularly angular fracture in the outermost mycelial layer, enlarging by radial splitting. Asci 2-spored when mature. Spores dark brown, cylindric, obtuse, 4-sepate, strongly constricted, 33—40 ⇌ 14—17 ⇌ 11—14 μ.

In the host leaf are minute globose haustoria in the epidermal cells, connected singly to the capitate hyphopodia by fine fibrils through the cuticle. Theissen & Sydow described a hypostroma in the leaf, but I have failed to observe any trace of such structure.

On *Piper retrofractum,* Philippines, PBS 8819, 8851, 9092, 21843, 21928, 23925, 25380, 27751, 27718, all represented in Herb. Farlow.

This is the type species of the genus *Actinodothis* Syd., which is therefore reduced to synonomy with *Amazonia.*

(302) **Amazonia stevensii** Hansf., nom. nov. (2101. 4230).

Syn.: *Actinodothis perrottetiae* Stev., Bishop Mus. Bull. **19**: 51. 1925.

This is represented in the Farlow Herb. by Stevens 1055 and Degener 3923, on *Perrottetia sandwicensis,* Hawaii. I find no character in either of these to separate this species generically from *Amazonia*:

Colonies amphigenous, more or less circular, dense, crustose, easily secedent, black, smooth, to 2 mm diam. Mycelium of dark brown hyphae 6—8 μ thick, the cells 10—15 μ long, substraight; in young colonies the branching is usually opposite at wide angles, but in mature colonies the hyphae, especially towards the margin, are numerous and parallel-radiating, with few hyphopodia, the branching obscure, the older colonies being solid plates with crenulate margin. Capitate hyphopodia alternate or more distant, spreading, straight or bent, very variable in form and size, 12—27 μ long; stalk cell cylindric, straight or bent, 2—7 μ long; head cell irregularly lobed, often bend and distorted, 10—20 ⇌ 10—18 μ. Mucronate hyphopodia few, mixed with capitate, alternate, bent ampulliform, 13—17 ⇌ 6—8 μ, the neck upturned, short, 3—4 μ thick. Setae none. Young perithecia

more or less orbicular, convex, black, smooth, the upper surface a solid plate of opaque brown radiating hyphae. Spores dark brown, bent cylindric to ellipsoid, obtuse, 3-septate, constricted, 40—45 ⇌ 16—18 μ.

In section the original single layer of mycelium and hyphopodia of the young colony is thickened by the addition of layers representing the radial extension of the ascoma, of which the locule is surrounded by a pale brown to subhyaline fibrous inner wall, passing above into the mass of radiating black prosenchyma overlying it; locule about 280 μ diam. and about 150 μ high in the centre, with an apical central pore through the inner wall, lined with short pale brown periphyses, opening on the surface by an irregular fissure or by radial fissures through the uppermost mycelial layer. In the leaf the epidermis is penetrated by pale brown hyphae individually connected to the capitate hyphopodia and to minute haustoria in the underlying palisade cells; no further penetration of the leaf was observed. Beneath the colony the leaf tissues turn brown, by the death of the epidermal and mesophyll cells, many of the latter being filled with brown granular matter. There is no vestige of any hypostroma; Stevens showed the internal hyphae penetrating deeper over a leaf vein, between the mesophyll cells, but none of my sections showed them, and I assume they connect with haustoria deeper within the mesophyll in these situations. I regard these „hyphae", which are 1—1.5 μ wide, as mere extensions of the normal filaments between hyphopodia and haustoria, similar to those of *Balladyna* spp.; they are non-septae and hence can hardly be termed an „internal mycelium".

(303) **Amazonia suttoniae** (Stev.) Hansf., comb. n. (3101. 6340).

Syn.: *Actinodothis suttoniae* Stev., Bull. Bishop Mus., **19**: 51. 1925.

Colonies hypophyllous, dense and crustose, circular, to 1 mm diam., usually smaller and crowded. Mycelium a solid plate of dark brown, radiating hyphae, nearly opaque 7—9 μ thick, the cells mostly 10—15 μ long, branching close, irregular, at acute angles. Capitate hyphopodia alternate or more scattered, closely antrorse, straight or bent, 14—22 μ long; stalk cell cylindric, 2—8 μ long; head cell entire, globose to cylindric with rounded apex, 10—16 ⇌ 8—14 μ. Mucronate hyphopodia very few, scattered, alternate, bent ampulliform, 15—20 ⇌ 7—8 μ, the neck 3—4 μ thick. Setae none. Perithecia flattened-radiate with irregular central apical pore, up to 500 μ diam. Spores dark brown, cylindric, obtuse, 4-septate, constricted, 53—61 ⇌ 21—24 μ.

On *Suttonia* sp., Hawaii, Stevens 1088 in Herb. Farlow.

(304) **Appendiculella acaenae** Hansf., sp. n. (2201. 4230).

Plagulae plerumque epiphyllae, usque ad 1 mm diam. vel confluentes, subdensae, leves. Mycelium ex hyphis atrobrunneis,

flexuosis, 6—7 μ cr. (cellulis plerumque 25—30 μ longis), opposite vel irregulariter ramosis, dense reticulato-intertextis compositum. Hyphopodia capitata alternata, subantrorsa, recta vel curvata, 20—40 μ longa, cellula basali cuneata vel cylindracea, 6—20 μ longa, cellula apicali irregulariter rotundato-angulosa vel lenissime lobata, 12—21 ⇌ 12—17 μ. Hyphopodia mucronata pauca, illis capitatis commixta, alternata, conoideo-ampullacea, curvata, 15—20 ⇌ 7—9 μ, collo suberecto, 3—4 μ cr. Setae nullae. Perithecia in centro plagularum aggregata, atra, globosa, usque ad 280 μ diam., superne appendicibus larviformibus numerosis ornata; appendices obtuse conoideae, atrobrunneae, transverse striatae, apice subuncinatae, subpellucidae, leves, usque ad 70 ⇌ 25 μ, sursum gradatim attenuatae. Sporae atrobrunneae, curvato-fusoideae, utrinque obtuse conoideae, 3-septatae, leniter constrictae, 34—43 ⇌ 12—13 μ.

Hab. in foliis *Acaenae* spec., Pichincha, Ecuador, L a g e r h e i m in R e h m, Ascomyceten 1121, sub *Meliola manca.*

(305) **Appendiculella doliocarpi** Hansf., sp. n. (3201. 6330).

Plagulae epiphyllae, raro etiam hypophyllae, densae, usque ad 3 mm diam., leves, atrae. Mycelium ex hyphis atrobrunneis, subrectis, 7—8 μ cr. (cellulis plerumque 25—35 μ longis), opposite lateque ramosis, radianto-reticulatis, compositum. Hyphopodia capitata alternata, plus minusve antrorsa, recta vel curvata, 22—40 μ longa; cellula basali cylindracea vel cuneata, 5—18 μ longa; cellula apicali raro subglobosa, integraque, plerumque rotundato-angulosa vel lenissime lobata, 15—23 ⇌ 11—20 μ. Hyphopodia mucronata in hyphis distinctis in centro plagularum evoluta, opposita vel plerumque alternata, ampullacea, 15—20 ⇌ 7—9 μ, collo 3—4 μ cr. Setae myceliales nullae. Perithecia dispersa, atra, globosa, verrucosa, usque ad 300 μ diam.; cellulis parietis obtuse conoideis vel in processibus conoideis atrobrunneis subopacis curvatis, usque ad 40 μ alt. et basi 30 μ diam., levibus vel lenissime verrucosis, obtusis productis. Sporae atrobrunneae, curvato-ellipsoideae, constrictae, 50—61 ⇌ 19—22 μ, cellula media crassiora.

Hab. in foliis *Doliocarpi* spec. indet., France Field, Panama, S t e v e n s, Fungi of Panama 233, in Herb. Farlow.

This was originally determined by Stevens as *Irene papillifera* Syd.

(306) *A p p e n d i c u l e l l a e c h i n u s* (P. Henn.) Hoehn., var. **domingensis** Hansf., var. n. (3201. 4220).

Plagulae amphigenae, tenues vel subdensae, leves, atrae, usque ad 4 mm diam. Mycelium ex hyphis brunneis, in epiphyllo subrectis, 6—9 μ cr. (cellulis plerumque 20—35 μ longis) alternatim vel opposite ramosis, laxe reticulatis compositum; in hypophyllo hyphis tortuosis, subdense reticulatis. Hyphopodia capitata alternata, plus minusve

antrorsa, in epiphyllo plerumque recta vel subcurvata, in hypophyllo tortuosa, 18—40 μ longa; cellula basali 5—20 μ longa, cylindracea; cellula apicali in epiphyllo late clavata, margine sinuata vel sublobata, in hypophyllo versiformi, raro ovata integraque, plerumque irregulariter angulosa vel lobata, curvata, 13—25 ⇌ 10—20 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel unilateralia, curvato-ampullacea, 13—20 ⇌ 6—8 μ. Setae nullae. Perithecia dispersa, atra, globosa, usque ad 210 μ diam., cellulis parietis numerosis in appendicibus larviformibus productis; appendices pellucide brunneae, continuae, obtusae, apice plus minusve curvatae vel uncinatae. tenuiter tunicate, leves vel indistincte transverse striatae, usque ad 80 μ longae et basi 15 μ crassae, sursum attenuatae, facile secedentes. Sporae atrobrunneae, cylindraceae vel subellipsoideae, obtusae, 4-septatae, constrictae, 35—41 ⇌ 17—18 μ.

Hab. in foliis *Cecropiae peltatae,* San Domingo, C i f e r r i, Mycofl. doming. exs. 261, typus in Herb. Kew.

The perithecial appendages easily fall from the more mature perithecia, which then appear as merely verrucose. The collection was determined originally by C i f e r r i as *Irene tonkinensis* var. *cecropiae* Stev., from which it differs in very much larger hyphopodia, the perithecia are larger with much longer appendages, which are also more numerous, the spores are larger than those I have measured from S t e v e n's Panama collections, which are only 32—36 ⇌ 14—15 μ, though mixed with other larger ones, which are definitely foreign.

(307) *A p p e n d i c u l l e l a l a r v i f o r m i s* (P. Henn.) Hoehn., var. **major** Hansf., var. n. (3203. 5320).

Plagulae amphigenae, plerumque hypophyllae, usque ad 10 mm. diam., tenues vel subdensae, leves. Mycelium ex hyphis atrobrunneis, subrectis vel leniter flexuosis, 6—9 μ cr. (cellulis plerumque 15—25 μ longis) opposite ramosis, laxe vel subdense reticulatis compositum. Hyphopodia capitata alternata vel usque ad 10% opposita, plus minusve antrorsa, recta vel curvata, 16—28 μ longa, cellula basali cylindracea, 4—8 μ longa, cellula apicali subglobosa integraque vel elongato-ellipsoidea et leniter rotundato-angulosa, 10—22 ⇌ 10—14 μ. Hyphopodia mucronata illis capitatis commixta, alternata vel opposita, ampullacea, 15—22 ⇌ 6—8 μ, collo suberecto, 3 μ cr. Setae myceliales nullae. Perithecia laxe gregaria, atra, globosa, usque ad 180 μ diam., superne appendicibus larviformibus 2—6 ornata; appendices usque ad 120 μ longae et basi 25 μ cr., sursum attenuatae, apice curvatae vel subuncinatae, 10 μ cr., transverse striato-annulatae, pellucide dilute brunneae vel luteo-hyalinae, continuae, tenuiter tunicatae, extus minute granulosae. Sporae atrobrunneae, ellipsoideae, obtusae, 4-septatae, constrictae, 41—50 ⇌ 17—20 ⇌ 13—15 μ.

Hab. in foliis *Acalyphae diversifoliae,* Honduras, Standley 56839 (typus in Herb. Farlow); Standley 55320, 53662; Panama, Stevens 699, 1070; in foliis *Acalyphae* sp., Costa Rica, 328, 366; Panama, Stevens 689, 1291.

On the type host the colonies are strongly parasitic, producing a brown spot.

(308) **Appendiculella perrottetiae** (Stev.) Hansf., comb. n.

Syn.: *Amazonia perrottetiae* Stev., Bull. Bishop Mus., **19**: 47. 1925. (2101. 3220).

Colonies hypophyllous, thin, smooth, to 1 mm. diam. or confluent. Mycelium of substraight to sinuous dark brown hyphae 6—7 μ thick, the cells mostly 15—25 μ long, branching alternate or irregular, not opposite, at acute angles, loosely reticulate. Capitate hyphopodia alternate, more or less antrorse, straight or bent, 15—25 μ long; stalk cell cuneate to cylindric, 4—9 μ long; head cell clavate-triangular, straight or bent, the angles rounded, or very shallowly lobate, 9—15 ⇌ 8—14 μ. Mucronate hyphopodia mixed with capitate, alternate or unilateral, ampulliform, 12—16 ⇌ 6—7 μ, the neck upturned, short, 3—4 μ thick. Setae none. Perithecia few, scattered, black, globose, up to 160 μ diam., the surface cells varying from conoid-mammillate to extended out into larviform appendages which are bent to uncinate, pale translucent brown, transversely striate, continuous, obtuse, up to 45 μ long by 13—15 μ wide at the base. Spores dark brown, bent cylindric with obtuse ends, 3-septate, constricted, 33—38 ⇌ 12—13 μ.

On *Perrottetia sandwicensis,* Kauai, Hawaii, F. L. Stevens 474 p. p. (mixed with *Amazonia stevensii* Hansf.)

(309) **Appendiculella vernoniae** (Stev.) Hansf., comb. n. (3201. 3220).

Syn.: *Irene sororcula* (Speg.) Stev. var. *vernoniae* Stev., Ann. Myc. **25**: 424. 1927.

Colonies epiphyllous, to 1 mm. diam., thin, smooth. Mycelium of brown hyphae 6—7 μ thick, the cells mostly 20—30 μ long, substraight to flexuous, branching opposite or irregular, at acute angles, loosely radiating-reticulate. Capitate hyphopodia alternate, more or less antrorse, straight or bent, 12—18 μ long; stalk cell cylindric, 2—5 μ long; head cell globose, entire, 10—12 μ diam. Mucronate hyphopodia mixed with capitate on some hyphae, opposite or alternate, bent ampulliform, 12—15 ⇌ 7—8 μ, neck 3 μ thick. Setae none. Perithecia few, loosely scattered, black, globose, verrucose, up to 150 μ diam., with 0—4 larviform appendages on upper half, nearly smooth, pale clear brownish, obtuse and slightly swollen at apex, continuous, straight or bent, up to 60 ⇌ 10—15 μ, in middle only about 8 μ thick, thin-walled. Spores dark brown, cylindric to subellipsoid, obtuse, 4-septate, 31—36 ⇌ 13—15 ⇌ 10—12 μ.

On *Vernonia* spp., Panama, Stevens 1132 (type), 308, 465, 1171, 1319, 1047; Costarica, Stevens 706; all in Herb. Farlow.

(310) *Irene acervata* (Ell. & Ev.) Hansf., var. **major** Hansf., var. n. (3101. 4230).

Plagulae epiphyllae, numerosae, subconfluentes, usque ad 2 mm diam., subdensae, leves. Mycelium ex hyphis atrobrunneis, sinuosis, 6—7 μ cr. (cellulis plerumque 20—30 μ longis), opposite ramosis, dense reticulato-intertextis compositum. Hyphopodia capitata alternata, recta, plus minusve antrorsa, 12—17 μ longa, cellula basali cylindracea 2—6 μ longa, cellula apicali globosa, integra, 9—13 ⇌ 8—11 μ. Hyphopodia mucronata illis capitatis commixta, opposita, alternata vel interdum ternata, ampullacea, 12—18 ⇌ 6—7 μ, collo 3 μ cr. Setae myceliales nullae. Perithecia in centro plagularum gregaria, atra, globosa, verrucosa, usque ad 210 μ diam., cellulis parietis obtuse conoideis vel mamillatibus, usque ad 18 μ alt. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 33—48 ⇌ 12—14 μ.

Hab. in foliis *Solanacearum* spec. indet., Caaguazu, Paraguay. Balansa 3583, typus in Herb. Kew.

This differs from the type in its larger spores, smoother perithecia and slightly larger hyphopodia.

(311) **Irene alchorneae-incurvae** Hansf., sp. n. (3101. 5320).

Plagulae epiphyllae, dispersae, tenues, leves, usque ad 3 mm diam. Mycelium ex hyphis undulatis vel flexuosis, atrobrunneis, 7—9 μ cr. (cellulis plerumque 30—40 μ longis), opposite vel irregulariter ramosis, laxe reticulatis compositum. Hyphopodia capitata alternata vel dispersa, saepius curvata, 30—40 μ longa, cellula basali cylindracea, 10—14 μ longa, cellula apicali subglobosa vel oblonga, integra vel subangulosa, rarius sublobata, apice rotundata vel truncata, 18—29 ⇌ 13—17 μ. Hyphopodia mucronata illis capitatis commixta, alternata, ampullacea, 23—30 ⇌ 9—11 μ, collo elongato suberecto, 3—4 μ cr. Setae nullae. Perithecia dispersa, atra, globosa, verrucosa, usque ad 180 μ diam. (? immatura), cellulis parietis obtuse conoideis. Sporae atrobrunneae, subellipsoideae, obtusae, constrictae, 4-septatae, 53—59 ⇌ 20—25 ⇌ 18—21 μ.

Hab. in foliis *Alchorneae incurvae*, Santa Catharina, Brazil, Ule, Herb. brasil. 916, in Herb. Stockholm.

(312) **Irene caaguazuensis** Hansf., sp. n. (3103. 4330).

Plagulae epiphyllae, dispersae, atrae, densae, leves, usque ad 1 mm. diam. Mycelium ex hyphis atrobrunneis, subrectis, 7—9 μ cr. (cellulis plerumque 15—20 μ longis) opposite acuteque ramosis, dense reticulatis compositum, subsolidum. Hyphopodia capitata alternata vel circa 5% opposita, plus minusve antrorsa, recta vel curvata,

14—23 μ longa, cellula apicali subglobosa vel late clavata, integra vel rotundato-angulosa, 9—17 ⇌ 9—13 μ. Hyphopodia mucronata illis capitatis commixta, ampullacea, opposita vel alternata, 18—28 ⇌ 7—9 μ, collo elongato, suberecto, 3 μ cr. Setae nullae. Perithecia in centro plagularum aggregata, atra, globosa, verrucosa, usque ad 280 μ diam., cellulis parietis rotundatis vel obtuse conoideis, usque ad 12 μ alt. Sporae atrobrunneae, late ellipsoideae, 4-septatae, constrictae, 40—48 ⇌ 20—25 μ.

Hab. in foliis *Rutacearum* spec. indet., Caaguazu, Paraguay, B a l a n s a 3585, in Herb. Kew.

(313) **Irene cecropiicola** Hansf., sp. n. (3101. 4220).

Plagulae epiphyllae, tenuissimae, usque ad 5 mm. diam. vel confulentes, leves, aegre perspicues. Mycelium ex hyphis atrobrunneis, subrectis, 7—9 μ cr. (cellulis plerumque 25—40 μ longis), opposite acuteque ramosis, laxe reticulatis compositum. Hyphopodia capitata alternata, plus minusve antrorsa, recta vel curvata, 23—35 μ longa, cellula basali cylindracea vel cuneata, 6—15 μ longa, cellula apicali subglobosa vel late piriformi, margine plus minusve crenulata, haud integra, 15—23 ⇌ 14—20 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, curvato-ampullacea, 17—25 ⇌ 8—10 μ collo 3 μ cr. Setae nullae. Perithecia laxe dispersa, atra, globosa, verrucosa, usque ad 180 μ diam., cellulis parietis obtuse conoideis vel submammillatibus, usque ad 18 μ alt. Sporae atrobrunneae, cylindraceae vel subellipsoideae, obtusae, 4-septatae, constrictae, 38—45 ⇌ 17—19 μ.

Hab. in foliis *Cecropiae* sp., Mana, Rio de Janeiro, Brazil, U l e, Herb. brasil. 2411, typus in Herb. Kew.

(314) **Irene guatemalensis** Hansf. sp. n. (3103. 4220).

Plagulae epiphyllae, densae, usque ad 2 mm. diam., leves. Mycelium ex hyphis atrobrunneis, rectis, 7—9 μ cr. (cellulis plerumque 12—20 μ longis) opposite ramosis, dense regulariter reticulatis compositum. Hyphopodia capitata circa 90% opposita, leniter antrorsa, subrecta, 14—18 μ longa, cellula basali cylindracea, 2—4 μ longa, cellula apicali cylindracea apice late rotundata, integra, 10—14 ⇌ 7—9 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel unilateralia, curvata, ampullacea, 15—20 ⇌ 7—9 μ, collo suberecto 3 μ cr. Setae myceliales nullae. Perithecia in centro plagularum subdense aggregata, atra, globosa, usque ad 190 μ diam., cellulis parietis obtuse conoideis, subpellucide atrobrunneis, usque ad 30 μ alt. Sporae atrobrunneae, late ellipsoideae, 4-septatae, leniter constrictae, 34—40 ⇌ 17—19 ⇌ 12—15 μ.

Hab. in foliis *Cupaniae glabrae,* Long Mountain, Jamaica, D e n n i s J. 109, typus in Herb. Kew; in foliis *C. guatemalensis,* Costa

Rica, Sydow, Fung. exot. exs. 625 in Herb. Pretoria sub *Irene glabroides* forma.

The latter specimen was the first known to me, but in view of the presence of a much higher proportion of opposite hyphopodia in the Jamaica specimen, I have chosen this as the type.

(315) **Irene miriopoda** (Cif.) Hansf., comb. n. (3103. 5320).

Syn.: *Meliola* (*Irenina*) *miriopoda* Cif., Ann. Myc., **36**: 215. 1938.

In the original description this species was confused with the mycelium of a species of *Asterina* occurring on the same leaves; the Herb. Kew portion of the type collection, contains only this *Asterina,* but both fungi are represented in the Herb. Stockholm portion of Ciferri 2893, on *Wallenia laurifolia,* San Domingo: —

Colonies amphigenous, crustose, solid, black, to 10 mm diam., easily secedent, scattered or sometimes confluent. Mycelium of substraight dark brown hyphae 7—10 μ wide, cells mostly 10—15 μ long, branching opposite or irregular, close, at wide angles, very densely reticulate and becoming solid. Capitate hyphopodia alternate or rarely opposite, subantrorse, straight or bent, 15—28 μ long; stalk cell cylindric, 2—14 μ long; head cell subglobose and entire, or variously angulose to lobed, straight or bent, 10—18 ⇌ 8—17 μ. Mucronate hyphopodia few, scattered, opposite or alternate, bent ampulliform, 16—20 ⇌ 7—9 μ, neck 3—4 μ thick. Setae none. Perithecia globose, verrucose, black, to 180 μ diam. Spores dark brown, cylindric, obtuse, 4-septate, constricted, 48—52 ⇌ 22—24 μ.

Most colonies are parasitised by *Trichothyrium* sp.

[(316) **Irene nectandrae** Hansf., sp. n. (3101. 5320).

Plagulae amphigenae, usque ad 3 mm. diam., vel confluentes, in epiphyllo parvae tenuesque, in hypophyllo majores densae, interdum in maculas brunneas sitae, leves. Mycelium ex hyphis sinuosis atrobrunneis, 6—9 μ cr. (cellulis plerumque 15—25 μ longis) opposite vel irregulariter lateque ramosis, laxe vel subdense reticulatis compositum. Hyphopodia capitata alternata, plerumque irregulariter curvata, in hypophyllo 17—30 μ longa, in epiphyllo usque ad 35 μ longa, cellula basali cylindracea, 6—10 μ longa, cellula apicali irregulari, curvata, leniter rotundato-lobata, 12—24 ⇌ 11—19 μ. Hyphopodia mucronata pauca, illis capitatis commixta alternata vel opposita, curvato-ampullacea, 14—20 ⇌ 6—8 μ, collo suberecto 3—4 μ cr. Sete nullae. Perithecia dispersa, atra, globosa verrucosa, usque ad 150 μ diam., cellulis parietis obtuse conoideis, usque ad 20 μ alt. Sporae atrobrunneae, ellipsoideae, obtusae, 4-septatae, constrictae, 46—52 ⇌ 19—22 μ.

Hab. in foliis *Nectandrae* sp., Wismar, British Guiana, Stevens 315, typus in Herb. Kew.

(317) **Irene sapii** Hansf., sp. n. (3101. 4220).

Plagulae epiphyllae, tenuissimae, usque ad 1 mm. diam., numerosae confluentesque. Mycelium ex hyphis atrobrunneis, subrectis 7—8 μ cr. (cellulis plerumque 20—30 μ longis), opposite vel irregulariter ramosis, laxe reticulatis compositum. Hyphopodia capitata alternata, subantrorsa, plerumque recta, 18—27 μ longa; cellula basali cuneata vel cylindracea, 4—9 μ longa, cellula apicali subglobosa vel piriformi, integra, 13—18 ⇌ 12—15 μ. Hyphopodia mucronata numerosa, illis capitatis commixta, opposita vel alternata, ampullacea, 14—20 ⇌ 6—8 μ, collo 3 μ cr. Setae nullae. Perithecia in centro plagularum laxe gregaria, atra, globosa, verrucosa, usque ad 170 μ diam., cellulis parietis rotundatis vel obtuse conoideis, usque ad 12 μ alt. Sporae atrobrunneae, cylindraceae vel subellipsoideae, obtusae- 4-septatae, constrictae, 38—44 ⇌ 18—19 μ.

Hab. in foliis *Sapii* spec., Para, Brazil, Baker, Plants of Amazon 194, typus in Herb. Kew.

(318) **Irene solanacearum** Hansf., sp. n. (3101. 3230).

Plagulae epiphyllae, subdensae, usque ad 1.5 mm. diam., leves. Mycelium ex hyphis atrobrunneis, flexuosis, vel tortuosis, 6—7 cr. (cellulis plerumque 20—30 μ longis) alternatim vel irregulariter ramosis, dense reticulatis compositum. Hyphopodia capitata alternata, recta vel curvata, 13—24 μ longa, cellula basali cylindracea, 3—7 μ longa, cellula apicali raro subglobosa integraque, plerumque irregulariter rotundato-angulosa, 10—15 ⇌ 8—13 μ. Hyphopodia mucronata in hyphis distinctis evoluta, alternata, raro opposita, ampullacea, 14—18 ⇌ 6—8 μ, collo brevi, 3 μ cr. Setae nullae, Perithecia in centro plagulaum laxe gregaria, atra, globosa, verrucosa, usque ad 215 μ diam., cellulis parietis conoideis, usque ad 30 μ alt. et 20—25 μ diam. Sporae atro-brunneae, cylindraceae, obtusae, 4-septatae, constrictae, 31—38 ⇌ 14—15 μ.

Hab. in foliis *Solanacearum* spec. indet., S. Miguel Ecuador, Stevens, Fungi af Ecuador 229, typus in Herb. Farlow.

(319) *Irene vilis* Syd., var. **citharexyli** Hansf., var. n. (3101. 4220).

Plagulae numerosae, amphigenae, usque ad 1 mm. diam., densae, leves, subinde confluentes. Mycelium ex hyphis subrectis vel leniter undulatis, atrobrunneis, 7—9 μ cr. (cellulis plerumque 15—25 μ longis), opposite vel irregulariter acuteque ramosis, dense reticulatis compositum. Hyphopodia capitata alternata, subantrorsa, recta vel curvata, 19—28 μ longa, cellula basali cuneata vel cylindracea, 6—10 μ longa, cellula apicali ovata vel clavata, apice late rotundata vel raro attenuata, integra, 14—20 ⇌ 10—13 μ. Hyphopodia mucronata in hyphis distinctis evoluta, alternata vel interdum opposita, curvato-ampullacea, 15—21 ⇌ 6—8 μ, collo 3—4 μ cr. Setae nullae. Perithecia

laxe dispersa, atra, globosa, verrucosa, usque ad 180 μ diam., cellulis parietis rotundatis, usque ad 10 μ alt. Sporae atrobrunneae, cylindraceae vel subellipsoideae, obtusae, 4-septatae, leniter constrictae, 39—45 ⇌ 16—19 μ.

Hab. in foliis *Citharexyli fruticosi,* San Domingo, Ciferri. Mycofl. doming. exs. 241, typus in Herb. Kew.

(320) **Irene schwenkiae** Hansf., sp. n. (3101. 4220).

Plagulae epiphyllae, usque ad 3 mm. diam., leves, subtenues. Mycelium ex hyphis atrobrunneis, rectis vel leniter undulatis, 7—8 μ cr. (cellulis plerumque 20—25 μ longis), opposite lateque ramosis, laxe reticulatis compositum. Hyphopodia capitata alternata, subantrorsa, recta vel apice recurvata, 20—25 μ longa, cellula basali cylindracea vel cuneata, 4—7 μ longa, cellula apicali globosa vel curvato-ovata, integra vel raro leniter rotundato-angulosa, 13—18 ⇌ 11—15 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, curvata, 13—18 ⇌ 6—8 μ, collo 3 μ cr. Setae nullae. Perithecia dispersa, atra, globosa, usque ad 140 μ dim., cellulis parietis obtuse conoideis vel apice truncatis, usque ad 20 μ alt. Sporae atrobrunneae, obtusae, 34—42 ⇌ 13—15 μ.

Hab. in foliis *Schwenkiae browalloidis,* Puerto La Cruz, Venezuela, Sydow, Fung. exot. exs. 795.

The type collection is represented both at Kew and Stockholm herbaria.

(321) **Irene scorodocarpi** Hansf., sp. n. (3101. 4330).

Plagulae hypophyllae, densae, leves, usque ad 5 mm. diam. vel confluentes. Mycelium ex hyphis atrobrunneis, subrectis vel leniter undulatis, 7—8 μ cr. (cellulis plerumque 13—20 μ longis) opposite vel irregulariter ramosis, dense reticulatis compositum. Hyphopodia capitata alternata, patentia, plerumque recta, 14—18 μ longa, cellula basali cuneata vel cylindracea, 3—5 μ longa, cellula apicali subglobosa vel lenissime rotundato-angulosa, plerumque integra, 10—13 ⇌ 8—11 μ. Hyphopodia mucronata pauca, illis capitatis commixta, opposita vel alternata, curvata, ampullacea, 16—25 ⇌ 7—9 μ, collo elongato 3 μ cr. Setae myceliales nullae. Perithecia dense dispersa, atra, globosa verrucosa, usque ad 290 μ diam., cellulis parietis curvato-conoideis vel mammillatibus, usque ad 30 μ alt. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae 42—49 ⇌ 18—21 μ.

Hab. in foliis *Scorodocarpi borneensis,* British North Borneo, Forest Dept. 4355, typus in Herb. Kew.

(322) **Irene ximeniae** Hansf., sp. n. (3103. 4340).

Plagulae amphigenae, plerumque hypophyllae, usque ad 1 mm. diam., densae, leves. Mycelium ex hyphis atrobrunneis, rectis, 8—11 μ cr. (cellulis plerumque 10—15 μ longis), opposite vel irregulariter,

lateque ramosis, densissime reticulatis compositum, subsolidum. Hyphopodia capitata alternata vel opposita, recta vel antrorse curvata, 15—25 μ longa, cellula basali cylindracea, 3—8 μ longa, cellula apicali subglobosa, vel oblonga, integra, 12—18 ⇌ 8—14 μ. Hyphopodia mucronata pauca, illis capitatis commixta, alternata vel opposita, ampullacea vel conoidea, 20—35 ⇌ 9—10 μ, collo elongato, 3—4 μ cr. Setae nullae. Perithecia in centro plagellarum laxe gregaria, atra, globosa, verrucosa usque ad 330 μ diam., cellulis parietis conoideis vel mammillatibus, usque ad 25 μ alt. Sporae atrobrunneae, ellpsoideae, obtusae vel apiculatae, 4-septatae, constrictae, 42—49 ⇌ 20—23 μ.

Hab. in foliis *Ximeniae americanae,* San Domingo, Ciferri, Mycofl. Doming. exs. 250, typus in Herb. Kew.

The colonies are remarkable in that the mycelium often forms solid "fans" of closely branched, radiating, exhyphopodiate hyphae, which at the edges of the "fan" become looser and bear hyphopodia. The species occurs mixed in this collection with *Irenopsis seyboensis* Cif.

(323) *Irenina sanguinea* (Ell. & Ev.) Stev., Ann. Myc. **25**: 448. 1927.

The type is Langlois 74 on *Rubus trivialis,* Louisiana, and is represented in Herb. Kew. My examination shows that this is identical with *Appenmiculella calostroma* (Desm.) Hoehn., and that Stevens was in error when he stated that there were no larviform appendages to the perithecia. It causes red leafspots on the host, but I have found similar spots of varying degree of discoloration on other species of *Rubus* attacked by this fungus.

(324) **Irenopsis cupanicola** Hansf., sp. n. (3401. 4220).

Plagulae epiphyllae, dispersae, usque ad 2 mm. diam., tenuissimae, leves. Mycelium ex hyphis atrobruneis, subrectis vel leniter undulatis, 6—8 μ cr. (cellulis plerumque 25—35 μ longis) opposite lateque ramosis, laxe reticulatis compositum. Hyphopodia capitata alternata, saepius irregulariter curvata 22—35 μ longa; cellula basali cylindracea, 7—15 μ longa, cellula apicali versiformi, saepius curvata, cylindracea, apice rotundata integraque, rotundato-angulosa vel irregulariter lobata, 15—25 ⇌ 10—18 μ. Hyphopodia mucronata pauca, illis capitatis commixta, alternata vel raro opposita, curvata ampullacea, 16—20 ⇌ 6—8 μ, collo 3 μ cr. Setae myceliales nullae. Perithecia laxe dispersa, atra, globosa, verrucosa, usque ad 200 μ diam., superne setis erecto-patentibus, usque ad 130 μ longis, subrectis vel apice curvatis vel uncinatis, levibus, obtusis, 2—3-septatis, tunica 1—1½ μ cr., ornata. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, leniter constrictae, 34—44 ⇌ 15—17 μ.

Hab. in foliis *Cupaniae guatemalensis,* Costa Rica, Sydow. Fung. exot. exs. 625, p. p., in Herb., Kew sub *Meliola glabroides* forma.

This differs from *I. cupaniae* Stev. in the larger and irregular hyphopodia.

(325) **Irenopsis dimorphandrae** Hansf., sp. n. (3403. 4220).

Plagulae hypophyllae, tenues, leves, usque ad 10 mm diam. vel confluentes. Mycelium ex hyphis atrobrunneis, flexuosis vel tortuosis, 5—8 μ cr. (cellulis plerumque 20—40 μ longis) opposite vel unilateraliter ramosis, laxe sinuoso-reticulatis compositum. Hyphopodia capitata alternata vel circa 2% opposita, recta vel curvata, 10—15 μ longa; cellula basali cylindracea, 2—5 μ longa, cellula apicali ovata vel piriformia, integra, 8—12 ⇌ 7—10 μ. Hyphopodia mucronata illis capitatis commixta, alternata, ampullacea, 18—25 ⇌ 6—8 μ, collo elongato 3 μ cr. Setae myceliales nullae. Perithecia laxe dispersa, atra, globosa, verrucosa, usque ad 160 μ diam., superne setis erecto-patentibus, usque ad 20, rectis, pellucide dilute brunneis, obtusis, levibus, usque ad 170 μ longis ornata. Sporae atrobrunneae, fusoideae, utrinque obtuse conoideae, 4-septatae, constrictae, 36—43 ⇌ 15—17 μ.

Hab. in foliis *Dimorphandrae* sp. indet., British Guiana, Stevens, Fungi of Br. Guiana 380, typus in Herb. Kew.

The setae are sometimes slightly swollen at the apex; the middle cell of the spore usually is both longer and wider than the others.

(326) *Irenopsis earleana* Cif., Mycopathologia **7**: 123. 1954.

Specimens examined: Ciferri, Mycofl. doming. exs. 182 on *Rhacoma crossopetalum,* San Domingo; Heller 6217 on *Crossopetalum,* Porto Rico; (the type of *I. compacta* (Earle) Stev., a name antedated by *Meliola compacta* Lev.)

The specimen Ule, Herb. brasil. 2204, on what appears to be either *Rhamnaceae* or *Celastraceae,* Brazil, in Herb. Kew, appears to me to be this same species.

(327) **Irenopsis myrciae** Hansf., sp. n. (3401. 5220).

Plagulae hypophyllae, usque ad 5 mm diam., tenues leves. Mycelium ex hyphis atrobrunneis, sinuosis vel flexuosis, 6—7 μ cr. (cellulis plerumque 20—30 μ longis), opposite vel irregulariter ramosis, laxe reticulato-intertextis compositum. Hyphopodia capitata alternata, recta vel varie curvata, 17—30 μ longa, cellula basali cylindracea, 3—10 μ longa, cellula apicali versiformi, subglobosa vel elongata, saepe curvata, integra vel irregulariter lobata, 12—23 ⇌ 9—17 μ. Hyphopodia mucronata illis capitatis commixta, alternata vel opposita, ampullacea, 16—24 ⇌ 8—9 μ, collo elongato, 3 μ cr. Setae myceliales nullae. Perithecia laxe dispersa, atra, globosa, verrucosa, usque ad 170 μ diam., superne setis 15—30, radiantibus, usque ad 150 ⇌ 6—8 μ, rectis vel leniter flexuosis, simplices, obtusis, levibus, continuis vel 1-septatis ornata. Sporae atrobrunneae, cylindraceae, 4-septatae, constrictae, 52 ⇌ 18 μ.

Hab. in foliis *Myrciae deflexae,* Bandera, Porto Rico, Stevens 8672 p. p., typus in Herb. Kew.

The perithecial setae have their apices either straight or subuncinate. Few spores were found in this specimen.

(328) **Irenopsis pteridicola** (Stev.) Hansf., comb. n.

Syn.: *Meliola pteridicola* Stev., Illin. Biol. Monogr., **2**: 28. 1916.

Stevens in Ann. Myc. **26**: 252, 1928, regarded the setae as originating from the perithecial disc, but examination of his Porto Rican specimens, and also of Ciferri, Mycofl. doming. exs. 108, on *Asplenium cristatum,* San Domingo, shows that these setae arise from the sides and upper parts of the perithecium, and are therefore to be regarded as true perithecial setae. They are simple, obtuse, smooth, straight or somewhat bent, continuous, up to 110 ⇌ 6—8 μ.

(329) **Irenopsis wrightii** (B. & C.) Hansf., comb. n. (3103. 4220).

Syn.: *Meliola wrightii* B. & C., Journ. Linn. Soc. Lond. **10**: 392. 1869. — *Irenina wrightii* (B. & C.) Stev., Ann. Myc. **25**: 450. 1927.

Examination of the type, Wright 881 on *Sapindaceae* indet., in Herb. Kew, shows that the perithecia have each 0—15 erect-spreading setae on the upper half; setae continuous or thinly 1-septate, simple, obtuse, more or less bent to tortuous at the apex, which is paler, the upper half finely and closely granulose-verruculose, up to 80 μ long by 6—7 μ thick.

(330) *Meliola amphigena* Stev. & Tehon, var. **rondeletiae** Hansf., var. n. (3111. 3222).

Plagulae amphigenae, usque ad 5 mm diam., saepe numerosae, minutae confluentesque, subdensae, velutinae. Mycelium ex hyphis atrobrunneis, subrectis vel sinuosis, 6—7 μ cr. (cellulis plerumque 20—25 μ longis) opposite lateque ramosis, dense reticulato-intertextis compositum. Hyphopodia capitata alternata, plus minusve antrorsa, recta vel curvata 12—21 μ longa, cellula basali cuneato-cylindracea, 2—6 μ longa, cellula apicali globosa vel ovata, apice rotundata, integra, 9—14 ⇌ 8—10 μ. Hyphopodia mucronata in hyphis distinctis evoluta, opposita vel alternata, ampullacea, 15—20 ⇌ 6—7 μ cr. Setae mycelia-les dispersae et juxta perithecia aggregatae, rectae vel leniter flexuosae, simplices, apice obtusae vel subacutae, usque ad 450 ⇌ 7—8 μ. Perithecia in centro plagularum laxe aggregata, atra, globosa, verrucosa, usque ad 140 μ diam. Sporae atrobrunneae, cylindraceae vel subellipsoideae, obtusae, 4-septatae, constrictae, 27—35 ⇌ 13—15 ⇌ 11—12 μ.

Hab. in foliis *Rondeletiae purdei,* Aragua, Venezuela, Sydow, Fung. exot. exs. 798, typus in Herb. Kew.

(331) **Meliola anacardiacearum** (Stev.) Hansf., comb. n. (3113. 4322).

Syn.: *Amazonia anacardiacearum* Stev., Ann. Myc. **25**: 413. 1927.

The type collection, Stevens 277 on ?*Tapirira* sp., British Guiana, is represented in the Farlow Herb.:

Colonies epiphyllous, 1.5—5.0 mm diam., black, rather thin, sometimes confluent. Mycelium of substraight dark brown hyphae 7—8 μ thick, the cells mostly about 25 μ long, branching usually opposite, loosely interwoven-reticulate. Capitate hyphopodia opposite or alternate, straight or bent, 15—20 μ long, stalk cell short cylindric, 2—4 μ long, head cell ovate to cylindric with rounded apex, entire or slightly rounded-angulose, 11—15 ⇌ 7—9 μ. Mucronate hyphopodia mixed with capitate, opposite or alternate, ampulliform, 17—22 ⇌ 7—9 μ, the neck 3—4 μ thick. Setae thinly scattered, erect, straight, simple, obtuse, up to 360 ⇌ 7—9 μ. Perithecia scattered, each on a radiate subiculum, globose, verrucose, up to 150 μ diam. Spores dark brown, cylindric, obtuse, 4-septate, slightly constricted, 40—45 ⇌ 18—20 μ.

Most colonies are parasitised by various fungi, which suppress the development of setae and perithecia.

(332) *Meliola citricola* Syd. var. **amyridis** Hansf., var. n. ($31^1/_3$3. 4323).

Plagulae amphigenae, plerumque hypophyllae, densae, usque ad 5 mm diam., tenuiter velutinae. Mycelium ex hyphis atrobrunneis, subrectis, 6—7 μ cr. (cellulis plerumque 20—30 μ longis), dense reticulatis compositum. Hyphopodia capitata opposita vel alternata, recta vel curvata, 13—20 μ longa, cellula basali cylindracea, 3—5 μ longa, cellula apicali cylindracea, apice rotundata, integra, 10—16 ⇌ 6—9 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 20—25 ⇌ 6—7 μ, collo 3—4 μ cr. Setae myceliales dispersae, etiam juxta perithecia aggregatae, rectae, simplices, acutae vel breviter dentatae (rarius usque ad 20 μ), usque ad 850 ⇌ 9—11 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 160 μ diam. Sporae atrobrunneae, cylindraceae vel ellipsoideae, obtusae, 4-septatae, constrictae, 39—45 ⇌ 17—21 μ.

Hab. in foliis *Amyridis diatrypae,* San Domingo, Ciferri. Mycofl. Doming. exs. 255 (typus in Herb. Kew).

On the lower surface the mycelial hyphae are very crooked and often geniculate, with the hyphopodia less commonly opposite and usually much bent, sometimes irregular in outline. Ciferri determined this as *M. monensis* Stev.

(333) **Meliola connaricola** Hansf., sp. n. (3113. 4323).

Plagulae plerumque epiphyllae, densae, tenuiter velutinae, usque ad 3 mm diam. Mycelium ex hyphis atrobrunneis, subrectis, 7—9 μ cr. (cellulis plerumque 10—16 μ longis), opposite lateque ramosis, dense reticulatis compositum, subsolidum. Hyphopodia capitata oppo-

sita vel alternata, recta vel curvula, leniter antrorsa, 18—25 μ longa, cellula basali cylindracea, 3—7 μ longa, cellula apicali cylindracea apice rotundata vel leniter attenuata, 13—19 ⇌ 7—10 μ. Hyphopodia mucronata pauca, illis capitatis commixta, opposita vel alternata, ampullacea, 20—25 ⇌ 8—9 μ, collo elongato, 3 μ cr. Setae myceliales laxe dispersae, rectae, simplices, obtusae vel acutae, opacae, usque ad 800 ⇌ 10—12 μ. Perithecia in centro plagularum laxe gregaria, atra, globosa, verrucosa, usque ad 180 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae 40—48 ⇌ 18—21 ⇌ 15—16 μ.

Hab. in foliis *Connari neurocalycis,* Rizal, Philippines, leg. Ramos, in Mus. Nat. Hist. Vindobon, 3424 (typus in Herb. Kew).

(334) *Meliola cyathodis* Hansf., var. **stypheliae** Hansf., var. n (2111. 7332).

Plagulae amphigenae, usque ad 2 mm diam., densae, atrae, fortiter adhaerentes. Mycelium ex hyphis atrobrunneis, flexuosis, 7—10 μ cr. (cellulis plerumque 15—20 μ longis), opposite vel irregulariter denseque ramosis compositum, in centro plagularum subsolidum. Hyphopodia capitata alternata siepius curvata, 23—35 μ longa, cellula basali cylindracea, curvata, 5—18 μ longa, cellula apicali clavata-piriformi, integra vel irregulariter fortiterque stellato-lobata, 15—23 ⇌ 11—19 μ. Hyphopodia mucronata non visa. Setae myceliales paucae, saepe nullae, plerumque juxta perithecia laxe aggregatae, erectae, rectae vel subhamatae, simplices, obtusae, usque ad 350 ⇌ 8—9 μ. Perithecia in centro plagularum laxe gregaria, atra, globosa, verrucosa, usque ad 230 μ diam. Sporae atrobrunneae, fusoideae utrinque obtuse conoideae, leniter curvatae, 3-septatae, subconstrictae 60—72 ⇌ 18—20 μ.

Hab. in foliis *Stypheliae philippinensis,* Celebes, Bunnemeijer 12220a, typus in Herb. Bogor, no. 13640.

(335) *Meliola dioscoreicola* Hansf. & Deighton, var. **peruviensis** Hansf., var. n. (31 3. 4232).

Plagulae epiphyllae, densae, usque ad 3 mm diam., velutinae. Mycelium ex hyphis atrobrunneis, subrectis, 7—8 μ cr. (cellulis plerumque 15—35 μ longis), opposite ramosis, laxe vel dense reticulatis compositum. Hyphopodia capitata alternata vel usque ad 30% opposita, recta vel curvata, 12—19 μ longa, cellula basali cylindracea, 2—5 μ longa, cellula apicali globosa vel distincte curvata, integra, 9—13 ⇌ 8—12 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 20—28 ⇌ 8—9 μ, collo elongato, 3 μ cr. Setae myceliales numerosae, dispersae et juxta perithecia aggregatae, erectae, subrectae, simplices, obtusae vel subacutae, vel varie dentatae usque ad 15 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 240 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 45—49 ⇌ 16—18 μ.

Hab. in foliis *Dioscoreae* spec. indet., Yurinagua, Peru, Ule, Herb. brasil. 3306, typus in Herb. Kew.

This was determined originally by Hennings as *M. pellucida.*

(336) *Meliola gaillardiana* Stev., var. **domingensis** Hansf., var. n. ($31^3/_4$1. 4222).

Plagulae amphigenae, atrae, densae, velutinae, usque ad 3 mm diam. vel confluentes. Mycelium ex hyphis atrobrunneis, subrectis vel flexuosis, 6—8 μ cr. (cellulis plerumque 10—15 μ longis), opposite ramosis, dense reticulatis compositum, subsolidum. Hyphopodia capitata alternata, rarissime opposita, plus minusve antrorsa, recta, 13—18 μ longa, cellula basali cylindracea, 2—6 μ longa, cellula apicali ovata vel piriforme, integra, 10—13 ⇌ 8—10 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel unilateralia, ampullacea, 14—20 ⇌ 7—10 μ, collo 3—4 μ cr. Setae myceliales dispersae, etiam juxta perithecia aggregatae erectae, retae, usque ad 400 ⇌ 9—10 μ, apice breviter 2—4-reflexo-dentatae vel 2—3-furcatae usque 10 μ, ramulis dentatis. Perithecia dispersa, atra, globosa, verrucosa, usque ad 150 μ diam. Sporae atrobrunneae, ellipsoideae, obtusae, 4-septatae, constrictae, 38—44 ⇌ 17—18 μ.

Hab. in foliis *Piperis samanensis,* Samana, San Domingo, Ciferri, Mycofl. doming. exs. 94-ter., typus in Herb, Kew.

(337) **Meliola illicii** (Cif.) Hansf., comb. n. (3141. 4321).

Syn.: *Meliola magnoliae* Stev., var. *illicii* Cif., Ann. Myc., **31**: 147. 1933.

This appears to be sufficiently distinct from the type of Stevens' species to warrant erection as a separate species; the type collection was distributed by Ciferri as Mycofl. doming. exs. 162, on *Illicium parviflorum,* San Domingo.

(338) **Meliola jamaicensis** Hansf., sp. n. (3111. 5333).

Plagulae hypophyllae, usque ad 15 mm diam., tenues vel densae, velutinae. Mycelium ex hyphis atrobrunneis, subrectis vel sinuosis, 7—8 μ cr. (cellulis plerumque 20—30 μ longis), opposite acuteque ramosis, laxe reticulatis compositum. Hyphopodia capitata alternata, patentia, recta vel sinuosa, 21—29 μ longa, cellula basali cylindracea, 5—8 μ longa, cellula apicali cylindracea vel anguste ellipsoidea, integra, 15—20 ⇌ 8—10 μ. Hyphopodia mucronata illis capitatis commixta, alternata vel opposita, ampullacea, 20—28 ⇌ 8—10 μ, collo elongato, 3 μ cr. Setae myceliales dispersae, rectae, usque ad 900 ⇌ 9—10 μ, apice simplices, subacutae, scabridae vel breviter dentatae usque ad 6 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 220 μ diam. Sporae atrobrunneae late ellipsoideae, 4-septatae, constrictae, 49—58 ⇌ 23—27 μ.

Hab. in foliis *Crotonis* spec. indet., Castleton Gardens, Jamaica, Hansford 683, typus in Herb. Kew.

(339) *Meliola kisubiensis* Hansf., var. **peleicola** Hansf., var. n. (3111. 5334).

Plagulae hypophyllae, tenues, leniter velutinae, effusae, confluentes. Mycelium ex hyphis atrobrunneis, subrectis vel leniter undulatis, 8—10 μ cr. (cellulis plerumque 15—20 μ longis), opposite lateque ramosis, laxe reticulatis compositum. Hyphopodia capitata alternata, plus minusve antrorsa et saepe recurvata, 15—22 μ longa, cellula basali cylindracea, 3—6 μ longa, cellula apicali subglobosa, ovata vel breviter cylindracea, apice rotundata, integra, 12—16 ⇌ 8—13 μ. Hyphopodia mucronata illis capitatis commixta, alternata vel opposita, ampullacea, 15—20 ⇌ 8—10 μ, collo 3—4 μ cr. Setae myceliales laxe dispersae, rectae, simplices, acutae, usque ad 1000 ⇌ 11—14 μ. Perithecia sparsa, atra, globosa, verrucosa, usque ad 220 μ diam. Sporae atrobrunneae, cylindraceae vel ellipsoideae, obtusae, 4-septatae, constrictae, 52—58 ⇌ 22—25 μ.

Hab. in foliis *Peleae* spec. indet., Mt. Kaala, Oahu, Hawaii, Shear 679 (typus in Herb. Stockholm, ex U.S.Dept. Agric. Myc. Herb. 71020).

In the type this species occurs mixed with *Meliola juddiana* Stev.

(340) *Meliola lepisanthea* Sacc. var. **schmideliae** Hansf., var. n. (3111. 3221).

Plagulae epiphyllae, usque ad 5 mm diam. vel late confluentes, tenues, leves. Mycelium ex hyphis atrobrunneis, rectis, radiantibus, 6—8 μ cr. (cellulis plerumque 15—24 μ longis), opposite vel irregulariter lateque ramosis compositum. Hyphopodia capitata alternata, subantrorsa, saepius recta, 12—19 μ longa, cellula basali cuneata, 3—7 μ longa, cellula apicali globosa, integra, 9—13 ⇌ 9—11 μ. Hyphopodia mucronata, pauca, illis capitatis commixta, opposita vel alternata, ampullacea, 15—18 ⇌ 6—8 μ, collo 3 μ cr. Setae myceliales paucae, juxta perithecia aggregatae, subrectae, simplices, obtusae, usque ad 200 ⇌ 6—7 μ. Perithecia in centro plagularum aggregata, atra, globosa, verrucosa, usque ad 160 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, subconstrictae, 29—34 ⇌ 12—14 μ.

Hab. in foliis *Schmideliae* sp., Ceylon, typus in Herb. Kew.

Collection details are absent from the specimen label.

(341) **Meliola medinillae** Hansf. (3111. 3222).

Plagulae hypophyllae, usque ad 10 mm diam., tenues vel in centro subdensae, tenuiter velutinae. Mycelium ex hyphis atrobrunneis, flexuosis, 5—6 μ cr. (cellulis plerumque 30—40 μ longis), opposite vel irregulariter ramosis, in centro plagularum dense reticulato-intertextis compositum. Hyphopodia capitata laxe dispersa, alternata vel unilateralia, saepius curvata, 20—30 μ longa, cellula basali cylin-

dracea, 5—10 μ longa, cellula apicali irregulariter ovata, saepe fortiter curvata, apice attenuato-rotundata, subintegra, 15—20 ⇌ 9—13 μ. Hyphopodia mucronata pauca, dispersa, opposita vel alternata, ampullacea, 15—20 ⇌ 7—8 μ, collo 3 μ cr. Setae myceliales dispersae et juxta perithecia aggregatae, rectae, simplices, obtusae, usque ad 400 ⇌ 8—9 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 150 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 29—33 ⇌ 11—13 ⇌ 10—14 μ.

Hab. in foliis *Medinillae disparifoliae,* Luzon, Philippines Phil. Bur. Sci. 9764, typus in Herb. Kew.

(342) *Meliola microspora* Pat. & Gaill., Bull. Soc. Myc. France, **4**: 104. 1892.

Three portions of the type collection have become available to me, from Kew and Stockholm (Gaillard, Champ. du Haut-Orenoque 262, 1887); the host plant, long assumed to be a Labiate, has now been determined for me by the authorities at Kew as *Vandellia diffusa,* a weed introduced from Africa to South America. Dr. Dennis informs me that amongst the numerous collections of this plant from Africa in the Kew Herbarium, no sign of this *Meliola* was found, nor has it yet been recorded from any part of Africa on this host. The same *Meliola* on the same host was reported by me previously as *M. ulei* Hansf. (Proc. Linn. Soc. London, **160**: 132. 1948).

Colonies amphigenous and caulicolous, black, dense, up to 1 mm diam. or widely confluent. Mycelium of substraight to flexuos-sinuous dark brown hyphae 5—7 μ thick, the cells mostly 15—20 μ long, branching opposite or irregular at acute angles, closely reticulate. Capitate hyphopodia alternate only, more or less antrorse, usually straight, 10—13 μ long; stalk cell cylindric, 2—5 μ long, head cell subglobose, entire, 7—10 ⇌ 6—10 μ. Mucronate hyphopodia few to numerous, mixed with capitate, opposite or alternate, ampulliform, 10—16 ⇌ 6—7 μ, neck short, 3 μ thick. Mycelial setae few, scattered, erect, straight or variously bent but not uncinate, simple, obtuse, up to 180 ⇌ 6—7 μ, the apex sometimes torulose. Perithecia scattered, black, globose, verrucose, up to 150 μ diam. Spores dark brown, cylindric, obtuse, 4-septate, constricted, 25—29 ⇌ 9—11 μ.

I have not yet decided how many of the numerous collections of *Meliola* on Labiatae in various parts of the world really belong to this secies, or whether some may need separation as distinct species.

(343) *Meliola osmanthi* Syd., var. **hawaiiensis** Hansf., var. n. 3111. 4322).

Plagulae epiphyllae, usque ad 3 mm diam., densae, velutinae. Mycelium ex hyphis atrobrunneis, subrectis, 6—7 μ cr. (cellulis

plerumque 15—20 μ longis), opposite vel irregulariter ramosis, dense reticulato-radiantibus compositum. Hyphopodia capitata alternata, antrorsa, recta vel leniter curvata, 20—30 μ longa, cellula basali cylindracea, 5—9 μ longa, cellula apicali cylindracea apice rotundata, integra, 12—22 ⇌ 7—9 μ. Hyphopodia mucronata pauca, in hyphis distinctis in centro plagularum evoluta, opposita vel alternata, ampullacea, 15—22 ⇌ 7—9 μ, collo 3 μ cr. Setae myceliales numersae, rectae, simplices, obtusae vel subacutae, usque ad 450 ⇌ 9—11 μ. Perithecia atra, globosa, verrucosa, usque ad 190 μ diam. Sporae atrobrunneae, cylindraceae vel subellipsoideae, obtusae, 4-septatae, constrictae, 40—47 ⇌ 17—20 μ.

Hab. in foliis *Osmanthi sandwicensis,* Kulwuon, Oahu, Hawaii, S t e v e n s, Fungi of Hawaii 146, typus in Herb. Kew.

Differs from the type in closely radiate colonies, with longer setae and smaller spores. The hyphae branch often at very acute angles and tend to radiate in strands, becoming more divergent at the edge of the colony, which is almost solid.

(344) *M e l i o l a p a n i c i* Earle, var. **major** Hansf., var. n. (3111. 5222).

Plagulae epiphyllae, atrae, subvelutinae, densae, usque ad 3 mm diam. vel confluentes. Mycelium ex hyphis atrobrunneis, subrectis vel flexuosis, 7—9 μ cr. (cellulis plerumque 25—40 μ longis) opposite vel irregulariter ramosis, dense reticulatis compositum. Hyphopodia capitata alternata plus minusve antrorsa, recta vel curvata, 20—30 μ longa, cellula basali cylindracea, 6—12 μ longa, cellula apical versiformia, subglobosa, angulosa, vel irregulariter clavato-cylindracea, saepe leniter lobata, 12—22 ⇌ 11—18 μ. Hyphopodia mucronata plerumque in hyphis distinctis evoluta, alternata vel opposita, ampullacea, 15—20 ⇌ 8—10 μ, collo suberecto, 3 μ cr. Setae myceliales dispersae, plus minusve rectae, simplices, obtusae, usque ad 420 ⇌ 9—11 μ, sursum leniter attenuatae. Perithecia dispersa, atra, globosa, verrucosa, usque ad 19 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 46—52 ⇌ 16—18 μ.

Hab. in foliis *Panici* spec., Brazil, U l e 182-b, in Herb. Stockholm, (det. R e h m, *„Meliola laxa Gaill.“*).

(345) *M e l i o l a p a n i c i* Earle var. **uniolae** Hansf., var. n. (3111. 4332).

Plagulae epiphyllae, usque ad 2 mm diam. vel confluentes, densae, velutinae. Mycelium ex hyphis atrobrunneis, rectis vel sinuosis, 7—9 μ cr. (cellulis plerumque 15—20 μ longis), alternatim vel irregulariter, rarius opposite ramosis, dense reticulatis compositum. Hyphopodia capitata alternata vel unilateralia, plus minusve antrorsa, saepe irregulariter curvata, 20—32 μ longa, cellula basali cylindracea vel cuneata, 5—14 μ longa, cellula apicali subglobosa, late

piriforme vel irregulariter anguloso-lobata 12—23 ⇌ 11—17 μ. Hyphopodia mucronata in hyphis distinctis evoluta, opposita vel alternata, 15—20 ⇌ 7—9 μ, collo 3 μ cr. Setae myceliales dispersae, etiam juxta perithecia aggregatae, numerosae, rectae, simplices, subacutae, usque ad 500 ⇌ 9—10 μ. Perithecia in centro plagularum laxe gregaria, atra, globosa verrucosa, usque ad 210 μ diam. Sporae atrobrunneae, cylindraceae vel subellipsoideae, obtusae, 4-septatae, constrictae, 40—48 ⇌ 18—21 μ.

Hab. in foliis *Uniolae virgatae,* San Domingo, C i f e r r i, Mycofl. Doming. exs. 205—bis, typus in Herb. Kew.

(346) **Meliola paullinicola** Hansf., sp. n. (31¹/₃3. 4222).

Plagulae epiphyllae, tenues, usque ad 2 mm diam., subleves. Mycelium ex hyphis rectis, atrobrunneis, 7—8 μ cr. (cellulis plerumque circa 30 μ longis), opposite acuteque ramosis, laxe radianto-reticulatis compositum. Hyphopodia capitata plerumque opposita, antrorse curvata, 16—24 μ longa, cellula basali cylindracea vel cuneata, 3—5 μ longa, cellula apicali globosa integraque, vel ovato-piriformi et rotundato-angulosa, 12—19 ⇌ 9—15 μ. Hyphopodia mucronata illis capitatis commixta, alternata vel opposita, curvato-ampullacea, 16—25 ⇌ 6—8 μ, collo elongato, 3 μ cr. Setae myceliales haud numerosae, praecipue juxta perithecia aggregatae, erectae, rectae, simplices acutaeque, vel 3—5-dentatae (— 6 μ), usque ad 400 ⇌8—9 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 180 μ diam. Sporae ellipsoideae, obtusae, 4-septatae, constrictae, atrobrunneae, 37—44 ⇌ 15—18 μ.

Hab. in foliis *Paulliniae* sp., Rio de Janeiro, Brazil, U l e, Herb. brasil. 2272, typus in Herb. Stockholm, ex Herb. R e h m, sub *M. malacotricha* f. *longispora* Gaill.

(347) **Meliola piperis-barbati** Hansf., sp. n. (3113. 4232).

Plagulae plerumque hypophyllae, usque ad 2 mm. diam., densae, velutinae. Mycelium ex hyphis subrectis vel leniter flexuosis, atrobrunneis, 7—9 μ cr. (cellulis plerumque 10—15 μ longis), opposite vel irregulariter, lateque ramosis, dense reticulatis compositum, subsolidum. Hyphopodia capitata alternata vel usque ad 10% opposita, plus minusve antrorsa, recta vel curvata, 12—20 μ longa, cellula basali cylindracea, 2—8 μ longa, cellula apicali globosa vel oblonga, integra, 9—14 ⇌ 7—9 μ, collo suberecto, 3 μ cr. Setae myceliales numerosae, dispersae, erectae, simplices, subrectae, obtusae vel subacutae, usque ad 400 ⇌ 7—9 μ. Perithecia in centro plagularum aggregata, atra, globosa, verrucosa, usque ad 220 μ diam. Sporae atrobrunneae, cylindraceae vel subellisoideae, obtusau, 4-septatae, constrictae, 37—43 ⇌ 14—16 μ.

Hab. in foliis *Piperis barbati,* Pichincha, Ecuador, S y d o w, Fung. exot. exs. 1045, p. p. (typus in Herb. Kew).

This occurs mixed with *M. pululahuensis* Gaill., under which name S y d o w distributed his specimen.

(348) *M e l i o l a r o u r e a e* Syd. var. **domingensis** Hansf., var. n. (3111. 6322).

Plagulae plerumque hypophyllae, densae, velutinae, usque ad 4 mm. diam., fortiter parasiticae et maculae epiphyllae brunneae formantes. Mycelium ex hyphis atrobrunneis, flexuosis, 7—10 μ cr. (cellulis plerumque 15—30 μ longis), opposite vel irregulariter ramosis, subdense reticulatis compositum. Hyphopodia capitata alternata, saepius varie curvata, 24—30 μ longa, cellula basali cylindracea, 4—8 μ longa, cellula apicali cylindracea vel clavata, integra, apice lata rotundata, recta vel curvata, 17—23 ⇌ 9—13 μ. Hyphopodia mucronata illis capitatis commixta, alternata, ampullacea, 23—29 ⇌ 8—10 μ, collo 3—4 μ cr. Setae myceliales numerosae, dispersae, opacae, erectae, rectae, simplices, acutae, usque ad 480 ⇌ 9—11 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 180 μ diam. Sporae atrobrunneae, cylindraceae vel subellipsoideae, 4-septatae, constrictae, 55—65 ⇌ 20—22 ⇌ 17—19 μ.

Hab. in foliis *Roureae surinamensis,* San Domingo, C i f e r r i, Mycofl. doming. exs. 32, typus in Herb. Kew.

(349) **Meliola sapindi-esculenti** Hansf., sp. n. ($31^1/_3$. 3221).

Plagulae amphigenae, plerumque epiphyllae et late subconfluentes, usque ad 3 mm. diam., subdensae, subleves. Mycelium ex hyphis atrobrunneis, subrectis vel leniter undulatis, 6—7 μ cr. (cellulis plerumque 15—20 μ longis), opposite lateque ramosis, dense reticulatis cgmpositum. Hyphopodia capitata alternata vel opposita, recta vel leniter curvata, patentia, 11—14 μ longa, cellula basali 2—4 μ longa, cylindracea, cellula apicali cylindracea vel ovata, apice rotundata, integra, 8—12 ⇌ 6—8 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 13—18 ⇌ 6—8 μ, collo 3 μ cr. Setae myceliales laxe dispersae etiam juxta perithecia aggregatae, erectae, rectae, simplices, acutae, vel 2-dentatae usque ad 7 μ, usque ad 320 ⇌ 7—8 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 180 μ diam. Sporae atrobrunneae, cylindraceae vel subellipsoideae, obtusae, 4-septatae, subconstrictae, 28—35 ⇌ 11—14 μ.

Hab. in foliis *Sapindi esculenti,* Para, Brazil, B a k e r, Plants of Amazon 380, typus in Herb. Stockholm.

(350) *M e l i o l a s c a b r i s e t a* Hansf. & Deight., var. **brasiliensis** Hansf., var. n. (3111. 4231).

Plagulae epiphyllae usque ad 1 mm. diam., subdensae. Mycelium ex hyphis atrobrunneis, subrectis vel undulatis, 7—8 μ cr. (cellulis plerumque 20—30 μ longis), opposite vel irregulariter lateque ramosis, laxe reticulatis compositum, in centro subdensum. Hyphopodia capi-

tata alternata, patentia, saepius recta, 20—27 μ longa, cellula basali cuneata vel cylindracea, 4—9 μ longa, cellula apicali subglobosa vel late piriformi, integra, 14—19 ⇌ 11—14 μ. Hyphopodia mucronata plerumque in hyphis distinctis evoluta, alternata, opposita vel ternata, ampullacea, 15—24 ⇌ 7—9 μ, collo 3 μcr. Setae myceliales sparsae, etiam juxta perithecia aggregatae, simplices, obtusae, usque ad 300 ⇌ 8 μ, sursum verrucosae vel tuberculatae. Perithecia in centro plagularum laxe aggregata, atra, globosa, verrucosa, usque ad 220 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 43—48 ⇌ 16—18 ⇌ 14 μ.

Hab. in foliis *Papilionacearum* spec. indet., U l e, Herb. brasil. 2290, typus in Herb. Stockholm, ex R e h m, sub *M. malacotricha* Speg.

(351) **Meliola schwenkiicola** Hansf., sp. n. (3113. 3222).

Plagulae plerumque epiphyllae, atrae, usque ad 2 mm. diam., interdum confluentes, subdensae, leniter velutinae. Mycelium ex hyphis atrobrunneis, sinuosis, 6—7 μ cr. (cellulis plerumque 18—25 μ longis), opposite vel irregulariter acuteque ramosis, dense reticulatis compositum. Hyphopodia capitata alternata vel opposita, recta vel curvata, 9—14 μ longa, cellula basali cuneata vel cylindracea, 2—5 μ longa, cellula apicali globosa vel ovata, integra, 7—11 ⇌ 7—9 μ. Hyphopodia mucronata pauca, illis capitatis commixta, opposita vel alternata, curvata, ampullacea, 14—18 ⇌ 6—8 μ, collo elongato 3 μ cr. Setae myceliales praecipue juxta perithecia evolutae, rectae, simplices, obtusae, ursque ad 450 ⇌ 7—9 μ. Perithecia in centro plagularum laxe aggregata, atra, globosa, usque ad 180 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 32—38 ⇌ 11—14 μ.

Hab. in foliis *Schwenkiae browalloidis,* Puerto La Cruz, Venezuela, S y d o w. Fung. exot. exs. 795, p. p., typus in Herb. Kew. (socio *Irenina schwenkiae* Hansf.)

(352) *M e l i o l a s e r j a n i a e* Stev. var. **densa** Hansf., var. n. (3133. 4222).

Plagulae epiphyllae, usque ad 2 mm. diam., densae, velutinae. Mycelium ex hyphis atrobrunneis, rectis, 7—8 μ cr. (cellulis plerumque 20—35 μ longis), opposite acuteque ramosis, dense reticulatis compositum. Hyphopodia capitata alternata vel usque ad 80% opposita, antrorsa vel patentia, plerumque recta, 12—20 μ longa, cellula basali cylindracea, 2—6 μ longa, cellula apicali typice 3-rotundato-angulosa vel sublobata, 8—15 ⇌ 10—16 μ. Hyphopodia mucronata pauca, illis capitatis commixta, ampullacea vel conoidea, 15—18 ⇌ 7—9 μ, collo 3—4 μ cr. Setae myceliales numerosae, biformes: (a) in mycelio dispersae, simplices, rectae, acutae, usque ad 500 ⇌ 9—10 μ, (b) juxta perithecia, usque ad 200 ⇌ 7—8 μ, simplices acutaeque, vel 2—3-dentatae usque ad 8 μ. Perithecia in centro plagularum laxe gregaria, atra, globosa, verrucosa, usque ad 170 μ diam. Sporae atro-

brunneae cylindraceae vel ellipsoideae, obtusae, 4-septatae, constrictae, 36—43 ⇌ 16—18 μ.

Hab. in foliis *Serjaniae diversifoliae,* San Domingo, C i f e r r i, Mycofl. doming. exs. 219—bis (typus in Herb. Kew); in foliis *S. polyphyllae,* C i f e r r i, l. c. 220.

(353) *M e l i o l a s e r j a n i a e* Stev. var. **major** Hansf., var. n. (3113. 4223).

Plagulae epiphyllae, atrae, tenues, velutinae, usque ad 5 mm. diam. Mycelium ex hyphis atrobrunneis, subrectis, 7—8 μ cr. (cellulis plerumque 20—25 μ longis), opposite lateque ramosis, laxe reticulatis compositum. Hyphopodia capitata alternata vel circa 2% opposita, plus minusve antrorsa, recta, 16—23 μ longa, cellula basali cylindracea, 3—8 μ longa, cellula apicali clavata, apice rotundata vel leniter 3-angulosa, 12—16 ⇌ 9—13 μ. Hyphopodia mucronata pauca, in hyphis distinctis evoluta, opposita vel alternata, ampullacea, 17—25 ⇌ 7—9 μ. Setae myceliales dispersae et juxta perithecia aggregatae, rectae, simplices, acutae, usque ad 700 ⇌ 8—10 μ. Perithecia laxe dispersa, atra, globosa, verrucosa, usque ad 190 μ diam. Sporae atrobrunneae, cylindraceae vel subellipsoideae, obtusae, 4-septatae, constrictae, 42—47 ⇌ 16—18 μ.

Hab. in foliis *Serjaniae* spec. indet., Rio Grande, Brazil, T h e i s s e n, Dec. Fung. brasil. 7, typus in Herb. Stockholm.

Differs from the type in the less irregular hyphopodia and larger spores. U l e, Herb. brasil. 615, on *Serjania, Itajahy,* Amazonia, differs from the above only in shorter setae (— 400 μ) with those around the perithecia only to 250 μ, and in slightly smaller spores 36—43 ⇌ 14—17 μ. S y d o w, Fung. exot. exs. 622, Costa Rica, is this variety.

(354) **Meliola spigeliae** Hansf., sp. n. (3111. 3221).

Plagulae amphigenae, tenues vel subdense, usque ad 2 mm. diam. vel confluentes, tenuiter velutinae. Mycelium ex hyphis atrobrunneis, subrectis vel undulatis, 5—7 μ cr. (cellulis plerumque 15—25 μ longis), opposite lateque ramosis, laxe vel dense reticulato-intertextis compositum. Hyphopodia capitata alternata, antrorsa, plerumque recta, 13—18 μ longa, cellula basali cylindracea, 3—4 μ longa, cellula apicali ovata, integra, saepius apice attenuata, 10—15 ⇌ 6—8 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 15—23 ⇌ 6—8 μ, collo 3 μ cr. Setae myceliales dispersae, etiam juxta perithecia aggregatae, erectae, rectae vel subflexuosae, haud uncinatae, simplices, sursum gradatim attenuatae, apice subacutae, usque ad 300 ⇌ 7—8 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 160 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, leniter constrictae, 24—32 ⇌ 10—12 μ.

Hab. in foliis *Spigeliae* sp., Brazil, U l e, Herb. brasil. 1284, typus in Herb. Stockholm, ex R e h m, sub *Meliola microspora.*

(355) *Meliola telosmae* Rehm, var. **tylophorae** Hansf., var. n. (3111. 3221).

Plagulae epiphyllae, tenues vel subdensae, tenuiter velutinae, usque ad 4 mm. diam. vel confluentes. Mycelium ex hyphis atrobrunneis, subrectis vel leniter sinuosis, 5—7 μ cr. (cellulis plerumque 20—30 μ longis) opposite acuteque ramosis, laxe vel subdense reticulato-intertextis compositum. Hyphopodia capitata alternata, subantrorsa, plerumque recta, 12—19 μ longa, cellula basali cylindracea, 3—7 μ longa, cellula apicali subglobosa vel ovata, integra, apice late rotundata, 9—13 ⇌ 7—10 μ. Hyphopodia mucronata in centro, plagularum illis capitatis commixta, opposita vel alternata, ampullacea, 13—16 ⇌ 7—8 μ, collo 3 μ cr. Setae myceliales numerosae, dispersae etiam juxta perithecia aggregatae, erectae, suberectae, simplices, obtusae, usque ad 240 ⇌ 7—8 μ, sursum leniter gradatim attenuatae. Perithecia dispersa, atra, globosa, verrucosa, usque ad 140 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae constrictae 26—32 ⇌ 11—12 μ.

Hab. in foliis *Tylophorae perrottetiae,* Los Banos, Philippineæ, Baker, PBS 2854 a, typus in Herb. Stockholm ex Rehm, sub *M. microspora.*

This differs from the type of *M. telosmae* mainly in the obtuse setae, which are fully mature in the specimen quoted.

(356) **Meliola xylosmaticola** Hansf., sp. n. (2111. 72?3).

Plagulae amphigenae, densae, velutinae, usque ad 3 mm. diam. vel confluentes. Mycelium ex hyphis atrobrunneis, rectis, 8—9 μ cr. (cellulis plerumque 25—30 μ longis), opposite vel irregulariter, lateque ramosis, laxe, demum dense reticulatis compositum. Hyphopodia capitata alternata, leniter antrorsa, recta, 25—40 μ longa, cellula basali cuneata vel cylindracea, 5—15 μ longa, cellula apicali irregulariter lobata, 20—25 ⇌ 14—20 μ. Hyphopodia mucronata illis capitatis commixta, ampullacea, 25—30 ⇌ 8—9 μ, collo 3—4 μ cr. Setae myceliales numerosae, dispersae, rectae, simplices, obtusae vel subacutae, usque ad 900 ⇌ 11—12 μ. Perithecia dispersa, atra, globosa, verrucosa, immatura. Sporae atrobrunneae, cylindraceae, saepe curvulae, obtusae, 3-septatae, constrictae, 63—77 ⇌ 16—18 μ.

Hab. in foliis *Xylosmatis buxifolii,* San Domingo, Ciferri, Mycofl. doming. exs. 189, typus in Herb. Kew.

(357) **Appendiculella echinata** (Gaill) Hansf., comb. n. (3201. 5320).

Syn.: *Meliola echinata* Gaill., Le Genre Meliola, 1892, p. 61. — *Irene echinata* (Gaill.) Theiss. & Syd., Ann. Mycol. **15**: 461. 1917.

The type in Herb. Paris, on unknown host, Sumatra, Forbes 3132, has been re-examined: —

Colonies hypophyllous, thin to 4 mm. diam., smooth. Mycelium of substraight to slightly and finely undulate dark brown hyphae, the cells 30—40 ⇌ 7—8 μ, branching opposite or irregular at acute angles, loosely reticulate. Capitate hyphopodia alternate, at wide angles, straight or bent, 20—28 μ long; stalk cell cuneate to cylindric, 6—12 μ long, head cell rounted to sublobate, versiform, 13—19 ⇌ 11—16 μ. Mucronate hyphopodia mixed with the capitate, alternate or opposite, long, bent ampulliform, 20—30 ⇌ 7—8 μ, the neck upturned, 3 μ thick. Setae none. Perithecia loosely scattered, black, globose, rough to 200 μ diam., with 4—8 conoid-cylindric appendages, bent at the apex, not uncinate, dark brown, smooth, up to 50 μ long by 20—25 μ wide at the base, attenuate to obtuse apex about 10 μ wide. Spores 4-septate, 50—52 ⇌ 12—20 μ (Gaillard, not seen by me).

The nearest approach to this I have so far seen is *Appendiculella ugandensis* (Hansf.) comb. n. (= *Irene ugandensis* Hansf.) on *Antiaris* in Uganda; the leaf of the present specimen could easily be that of a species of *Ficus*.

(358) *Appendiculella tonkinensis* (Karst. & Roum.) Toro, Mycologia **19**: 71. 1926. (3201. 4220).

Syn.: *Meliola tonkinensis* Karst. & Roum., Rev. Mycol., **12**: 77. 1890. — *Meliola reticulata* Karst. & Roum., l. c. p. 78.

The type is represented by Roumeguere, Fung. sel. exs. 5944 in Herb. Paris, on *Ficus* sp., Tonkin, leg. Balansa; other portions of the same collection are also in Herb. Paris and correspond:

Colonies amphigenous, on the upper surface very thin, on lower surface denser and up to 6 mm diam. or confluent. Mycelium of substraight dark brown hyphae 6—7 μ thick, the cells mostly 25—35 μ long, branching usually opposite at acute angles, loosely reticulate. Capitate hyphopodia alternate, antrorse or spreading, straight or bent, 14—22 μ long; stalk cell cuneate to cylindric, 3—8 μ long; head cell globose, entire, 10—15 ⇌ 9—12 μ. Mucronate hyphopodia mixed with capitate, alternate or opposite, 15—22 ⇌ 7—8 μ, ampulliform with the neck upturned, 3—4 μ thick. Perithecia scattered, black, globose, to 170 μ diam. (without appendages), most of the surface cells prolonged into dark brown, subtranslucent transversely rugose-striate, obtuse, straight or bent appendages, up to 45 ⇌ 25 μ, tapering to about 10 μ at the apex. Spores dark brown, fusoid with conoid-obtuse ends, 4-septate, constricted, 37—43 ⇌ 15—16 μ.

Hypophyllous colonies have very crooked, irregularly branched mycelium penetrating the tomentum of the leaf, and the capitate hyphopodia have long stalk cells.

(359) *Irenopsis guignardii* (Gaill.) Stevens, Ann. Mycol. **25**: 433. 1927. (2401. 5350).

Syn.: *Meliola guignardii* Gaill., Bull. Soc. Myc. France, **8**: 176. 1892.

On unknown host, Sao Jacoto, Ecuador, Lagerheim, July 1892, in Herb. Paris:

Colonies epiphyllous, dense, to 2 mm diam. Mycelium of crooked dark brown hyphae 8—11 μ thick, the cells mostly 20—40 μ long, branching opposite or irregular, closely reticulate and interwoven. Capitate hyphopodia alternate or unilateral, straight or irregularly bent, 35—55 μ long; stalk cell cuneate to cylindric, 10—25 μ long; head cell irregularly rounded-angulose to lobate, versiform, 25—35 ⇌ 13—25 μ. Mucronate hyphopodia mixed with capitate, ampulliform, bent, 20—25 ⇌ 8—9 μ, the neck upturned 3—4 μ thick. Mycelial setae none. Perithecia 2—3-aggregate in centre of colony, black, globose, verrucose, to 450 μ diam. Perithecial setae numerous, flexuous-tortuous, up to 500 ⇌ 8—10 μ, 2—3-septate, the apex obtuse or slightly clavulate, the setae reflexed around the perithecium to the mycelial network. Spores dark brown, cylindric-ellipsoid, obtuse, 3-septate, constricted 50—56 ⇌ 22—24 μ. (Gaillard gave them as 62—66 μ long).

The host leaf is large, and possibly that of some composite.

(360) **Irenopsis laevis** (Berk. & Curt.) Hansf. (3403. 4220).

Syn.: *Meliola laevis* B. & C. in Herb.

Plagulae amphigenae, usque ad 2 mm diam., densae, leves. Mycelium ex hyphis subrectis, atrobrunneis, 7—8 μ cr. (cellulis plerumque 10—15 μ longis), opposite denseque ramosis, dense reticulatis, compositum, subsolidum. Hyphopodia capitata opposita, raro alternata, plus minusve antrorsa, recta vel curvata, 13—20 μ longa, cellula basali breviter cuneata vel cylindracea, 2—5 μ longa, cellula apicali subglobosa vel late piriformi, integra, 10—15 ⇌ 9—12 μ. Hyphopodia mucronata pauca, illis capitatis commixta, alternata vel opposita, ampulliformia, 13—20 ⇌ 7—8 μ, collo suberecto 4 μ cr. Setae myceliales nullae. Perithecia dispersa vel in centro plagularum laxe aggregata, atra, globosa, verrucosa, usque ad 160 μ diam., cellulis parietis obtuse conoideis; sursum setis 8—12 ornata; setae rectae, simplices, subacutae, continuae vel 1-septatae, sursum dilutiores et dense verruculosae, usque ad 90 ⇌ 8—9 μ, erecto-patentes. Sporae atrobrunneae, cylindraceae vel ellipsoideae, obtusae, 4-septatae, constrictae, 37—42 ⇌ 17—19 μ.

Hab. in foliis ignotis, Cuba, Wright 396 in Herb. Kew sub *Meliola glabra* B. & C.

(361) **Balladynopsis ledermannii** (Syd.) Hansf., comb. nov.

Syn.: *Balladyna ledermannii* Syd., Engl. Bot. Jahrb., **54**: 254. 1916.

The type collection, L e d e r m a n n, 18. 5. 1912, on *Bignoniaceae* indet., Sepik, New Guinea, is represented in the Farlow Herb., and has been re-examined:

Colonies amphigenous, 2—8 mm diam., black, rather dense, smooth. Mycelium of dark brown, substraight hyphae 3—4 μ wide, the cells mostly 20—30 μ long, irregularly branched and becoming rather closely reticulate. Hyphopodia alternate or more scattered, subglobose, mostly with slightly angular or crenulate margin, sometimes shallowly lobed, continous, concolorous with hyphae, 4—6 μ diam. Mycelial setae none. Perithecia numerous, erect and subsessile on the hyphae, globose, black, 40—65 μ diam., the wall of one layer of dark brown angular parenchyma, about 5 μ thick. Asci one to several, maturing in succession, fasciculate in the base of the perithecium, possibly mixed with sterile ones, which appear as indistinctly mucose-fibrous tissue. Asci ovate, sessile, broadly rounded and thickened above when young to 5 μ, 8-spored, up to 40 ⇌ 25 μ. Spores conglobate, oblong with rounded obtuse ends, pale brown, smooth, 1-septate at or near the middle, 13—16 ⇌ 4—5 μ, the cells equal or the upper slightly shorter. The perithecia have each 3—6 spreading setae around the apex, up to 90 ⇌ 7 μ 3—5-septate, obtuse, with thick walls and very finely roughened surface; they descend to the leaf surface amongst the mycelial hyphae and are dark brown.

(362) **Irenopsis passiflorae** Hansf., sp. n. (3403. xxx0).

Plagulae hypophyllae et caulicolae, tenues, usque ad 3 mm diam., leves. Mycelium ex hyphis flexuosis, 6—9 μ cr., cellulis plerumque 18—28 μ longis, opposite ramosis, irregulariter radianto-reticulatis compositum, Hyphopodia capitata alternata vel opposita, recta vel curvata, 18—27 μ longa, cellula basali cuneata vel cylindracea, 2—10 μ longa, cellula apicali globosa, vel ovata, integra vel rotundato-angulose, 15—23 ⇌ 11—17 μ. Hyphopodia mucronata pauca, illis capitatis commixta, alternata vel opposita, ampulliformia, 17—23 ⇌ 8—9 μ, collo suberecto 3 μ cr. Setae myceliales nullae. Perithecia dispersa, altra, globosa, immatura, sursum setis erecto-patentibus 3—6 ornata; setae rectae, atrobrunneae, 1—2-septatae, simplices, obtusae, usque ad 140 ⇌ 9—10 μ, leves, apice dilutiores. Sporae non visae.

Hab. in foliis et caulibus *Passiflorae* spec. indet., San Jorge, Ecuador, L a g e r h e i m (in Herb. Paris sub *Meliola hispida* Gaill., ined.).

Rehm and also Theissen report „*Meliola molleriana* Wint." on *Passiflora* spp. in Brazil; as this species is limited to Malvaceae, they possibly had that described above, but I have not seen any of their specimens.

(363) **Irene amphilophii** Hansf., sp. n. (3101. 4230).

Plagulae epiphyllae, usque ad 1.5 mm diam., densae, leves. Mycelium ex hyphis atrobrunneis, subrectis vel leniter undulatis, 7—8 μ cr., cellulis 25—30 μ longis, alternatim vel irregulariter acuteque ramosis, dense radianto-reticulatis compositum. Hyphopodia capitata alternata, leniter antrorsa, plerumque recta, 26—38 μ longa, cellula basali tenuiter cuneata, 10—15 μ longa, cellula apicali ovata, integra, apice attenuato-rotundata, 18—24 ⇌ 10—12 μ. Hyphopodia mucronata in hyphis distinctis in centro plagularum evoluta, opposita vel alternata, ampullacea, 16—25 ⇌ 6—8 μ, collo elongato, suberecto, 3 μ cr. Setae myceliales nullae. Perithecia in centro plagularum laxe aggregata, atra, globosa, leniter verruculosa, usque ad 240 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-sept., leniter constrictae, 36—42 ⇌ 14—15 μ.

Hab. in foliis *Amphilophii vauthieri,* S. Leopoldo do Sul, Brazil, Theissen in Rehm, Ascomyceten 1824, in Herb. Stokholm ex Herb. Sydow.

This was published by Rehm in Ann. Mycol. **7**: 140, 1909, as *Meliola plebeja* Speg.

(364) *Irene andromedae* (Pat.) Sydow, Ann. Mycol. **15**: 194. 1917. (2101. 5240).

Syn.: *Meliola andromedae* Pat., Rev. Mycol., **10**: 137. 1888.

The type on *Andromeda salicifolia,* Reunion, leg. Vincent, in Herb. Paris, as well as a second collection by Boivin, 1849—52 on *A.* sp., Reunion, have been examined:

Colonies only hyphphyllous, dense, smooth, 3—6 mm diam. Mycelium of dark brown, substraight to undulate hyphae 6—8 μ wide, the cells mostly 15—30 μ long, branching opposite or irregular at varying angles, closely reticulate and becoming nearly solid in the centre of larger colonies. Capitate hyphopodia alternate, usually bent, 13—22 μ long; stalk cell cylindric, 3—9 μ long; head cell ovoid, often bent, entire, 10—13 ⇌ 8—11 μ. Mucronate hyphoopodia few, mixed with capitate, alternate or opposite, ampulliform, 14—19 ⇌ 6—7 μ, neck upturned 3 μ thick. Perithecia in loose central group, black, globose, verrucose, to 350 μ diam.; surface cells obtusely conoid, up to 25 μ high. Spores dark brown, cylindric, obtuse, 3-septate, strongly constricted, 48—54 ⇌ 16—18 μ.

(365) *Irene boni* (Gaill.) Sydow, Ann. Mycol., **15**, 194. 1917. (2101. 5330).

Syn.: *Meliola boni* Gaill., Le Genre *Meliola,* 1892, p. 39. — *Irenina boni* (Gaill.) Stev., Ann. Mycol., **25**, 449. 1927.

On unknown host, Tonkin, Bon 3319 in Herb. Paris:

Colonies epiphyllous, 1 mm diam., dense, smooth. Mycelium of substraight dark brown hyphae 7—8 μ thick, the cells mostly about 20 μ long, branching opposite at acute angles, closely radiating-

reticulate. Capitate hyphopodia alternate, more or less antrorse, straight or bent, 20—29 μ long; stalk cell cuneate or cylindric, 6—10 μ long; head cell irregularly 2—4-rounded-lobate, 13—19 ⇌ 12—18 μ. Mucronate hyphopodia scattered amongst capitate, alternate, ampulliform, bent, 18—8 μ, the neck upturned, 3 μ thick; rarely opposite. Setae none. Perithecia loosely grouped in centre of colony, black, globose, rough, to 230 μ diam.; surface cells obtusely conoid, up to 20 μ high. Spores bent fusoid with obtuse ends, 3-septate, constricted, 47—52 ⇌ 18—22 μ, the end cells rather smaller than the middle ones.

(366) *Irene ekebergiae* Doidge, var. **paraguayensis** Hansf., var. n. (3101. 42?0). ✓

Plagulae epiphyllae, usque ad 2 mm diam., subtenues, leves. Mycelium ex hyphis atrobrunneis, flexuosis, 7—9 μ cr., cellulis plerumque 20—30 μ longis, opposite vel irregulariter ramosis, laxe reticulatis compositum. Hyphopodia capitata alternata (rarissime opposita), curvata vel uncinata, 27—37 μ longa, cellula basali cylindracea, curvata, 7—15 μ longa, cellula apicali versiformi, irregulariter curvata vel uncinata, lobata, 12—24 ⇌ 9—17 μ. Hyphopodia mucronata pauca, illis capitatis commixta, opposita vel alternata, curvata, ampullacea, 17—20 ⇌ 7—9 μ, collo suberecto 3 μ cr. Setae nullae. Perithecia dispersa, atra, globosa, immatura. Sporae atrobrunneae, cylindraceae vel subellipsoideae, obtusae, 4-septatae, constrictae, 35—40 ⇌ 15—17 μ.

Hab. in foliis *Meliacearum* spec. indet., Paraguay, Balansa 4761 in Herb. Stockholm, ex Bresadola.

(367) **Irene gaillardii** Hansf., sp. n. (3101. 3230). ✓

Plagulae plerumque hypophyllae, usque ad 8 mm. diam., vel confluentes et majores, tenues, leves. Mycelium ex hyphis atrobrunneis, undulatis vel flexuosis, 7—8 μ cr., cellulis plerumque 20—40 μ longis, alternatim vel irregulariter acuteque ramosis, laxe reticulato-intertextis compositum. Hyphopodia capitata alternata, plus minusve antrorsa, recta vel curvata, 18—30 μ longa, cellula basali cuneata, 5—8 μ longa, cellula apicali piriformi vel irregulariter rotundato-angulosa, saepe curvata, 16—24 ⇌ 11—17 μ. Hyphopodia mucronata in hyphis distinctis evoluta, alternata vel opposita, ampullacea, 16—27 ⇌ 7—9 μ, collo elongato, suberecto, 3 μ cr. Setae nullae. Perithecia laxa dispersa, atra, globosa, verrucosa, usque ad 260 μ diam., cellulis parietis obtuse conoideis, interdum curvatis, usque ad 30 μ alt. et 40—45 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 36—42 ⇌ 15—17 μ.

Hab. in foliis ?*Solani* spec. indet., Ecuador, July 1892, Lagerheim, in Herb. Paris sub. „*Meliola verrucosa* Gaill." (ined.).

(368) **Irene gay-lussaciae** Hansf., sp. n. (2101. 5220).

Plagulae epiphyllae, usque ad 2 mm. diam., subdensae, leves. Mycelium ex hyphis atrobrunneis subrectis vel flexuosis, 7—9 μ cr., cellulis plerumque 15—25 μ longis, opposite vel irregulariter, obtuse ramosis, dense reticulatis compositum. Hyphopodia capitata alternata, patentia, recta vel interdum curvata, 18—24 μ longa, cellula basali cylindracea, 4—9 μ longa, cellula apicali piriformi, integra, 13—16 ⇌ 9—12 μ. Hyphopodia mucronata dispersa, alternata vel opposita, ampullacea, 17—23 ⇌ 8—9 μ, collo suberecto 3 μ cr. Setae nullae. Perithecia dispersa, atra, globosa, verrucosa, usque ad 170 μ diam., cellulis parietis obtuse rotundatis vel submammillatibus, usque ad 20 μ alt. Sporae atrobrunneae, subellipsoideae, 3-septatae, constrictae, 44—52 ⇌ 16—18 μ.

Hab. in foliis *Gay-lussaciae brasiliensis*, Sta. Catharina, Brazil, U l e 90, in Herb. Paris.

This was reported as „*Meliola pulchella* Speg." by G a i l l a r d and by P a z s c h k e; it is also represented in Herb. Stockholm.

(369) **Irene henningsii** (Beeli) Hansf., comb. n. (3101. 4230).

Syn.: *Meliola solanicola* P. Henn., Engl. Bot. Jahrb. **28**: 326. 1901 (non Gaill.).

Meliola henningsii Beeli, Bull. Jard. Bot. Bruxelles, **7**: 100. 1920.

The type collection, H o l s t 4231 on *Solanum englerianum* Usambaras, Tanganyika, is represented in Herb. Stockholm: —

Colonies amphigenous, to 1 mm. diam., or confluent, dense, smooth. Mycelium of crooked dark brown hyphae 6—7 μ wide, the cells mostly 13—20 μ long, branching alternate at acute angles, densely reticulate. Capitate hyphopodia alternate, antrorse, straight, 14—18 μ long; stalk cell rounded-angulose to shallowly lobed, 10—15 ⇌ 10—18 μ. Mucronate hyphopodia on separate hyphae, opposite or alternate, ampulliform, 15—20 ⇌ 7—8 μ, the neck upturned, 3 μ thick. Mycelial setea none. Perithecia in a loose central group, black, globose, verrucose, to 260 μ diam., the surface cells rounded or prolonged into blunty conoid outgrowths which become translucent brown but not striate, up to 50 μ high by 30 μ diam., at the base. Spores dark brown, cylindric obtuse, 4-septate, constricted, 35—42 ⇌ 13—15 μ.

(370) **Irene peruviana** (Syd.) Hansf., comb. n. (3101. 3220).

Syn.: *Meliola peruviana* Syd., Ann. Mycol. 14, 75. 1916.

On *Bignoniaceae* indet., Seringal Auristella, Peru, U l e. Herb. brasil. 3452, in Herb. Stockholm ex S y d o w: —

Colonies epiphyllous, thin, smooth, to 2 mm. diam. or confluent. Mycelium of more or less undulate, dark brown hyphae 5—7 μ thick, the cells mostly 20—25 μ long, branching usually opposite at wide angles, loosely reticulate. Capitate hyphopodia alternate, antrorse or spreading, straight or bent, 12—17 μ long; stalk cell cylindric or

cuneate, 3—6 μ long; head cell globose to wide ovate, entire, 9—12 ⇌ 7—10 μ. Mucronate hyphopodia mixed with capitate, opposite or alternate, bent ampulliform, 13—17 ⇌ 5—8 μ, the neck elongate, upturned 3 μ thick. Setae none. Perithecia loosely scattered, black, globose, verrucose, to 170 μ diam.; the surface cells obtusely conoid, to 12 μ high. Spores dark brown, cylindric, 4-septate, slightly constricted, 28—34 ⇌ 10—12 μ.

(371) **Irene mammillata** Hansf., sp. nov. (3101. 3220). ✓

Plagulae epiphyllae, densae, atrae, leves, usque ad 3 mm diam., raro confluentes. Mycelium ex hyphis subrectis vel sinuosis, atrobrunneis, 6—7 μ cr., cellulis 15—30 μ longis, opposite vel irregulariter acuteque ramosis, dense radianto-reticulatis compositum. Hyphopodia capitata alternata, recta vel curvata, antrorsa vel patentia, 17—23 μ longa, cellula basali cylindracea, 3—10 μ longa, cellulata apicali ovata, piriformi vel clavata, integra, 12—16 ⇌ 8—10 μ. Hyphopodia mucronata dispersa, alternata, raro opposita, ampullacea, 28—24 ⇌ 7—9 μ, collo elongata, surerecto 3 μ cr. Setae nullae. Perithecia dispersa, atra, globosa, usque ad 180 μ diam., cellulis parietis obtuse conoideis vel mammillatibus, usque ad 25 μ alt. Sporae atrobrunneae, cylindraceae vel subellipsoideae, obtusae, 4-septatae, constrictae, 34—39 ⇌ 14—16 μ.

Hab. in foliis *Myrtacearum* spec. indet., Avenida, Sao Paulo, Brazil, U s t e r i 86, typus in Herb. Stockholm.

(372) **Irene mendonciae** Hansf., sp. n. (3101. 4320). ✓

Plagulae epiphyllae, tenues, usque ad 2 mm. diam. vel confluentes, leves. Mycelium ex hyphis atrobrunneis, subrectis vel sinuosis, 6—8 μ cr., cellulis plerumque 20—30 μ longis, opposite vel irregulariter obtuseque ramosis, laxe reticulatis compositum. Hyphopodia capitata alternata plus minusve antrorsa, recta vel curvata, 18—25 μ longa, cellula basali cuneata vel cylindracea, 5—8 μ longa, cellula apicali globosa vel late piriformi, integra, 12—18 ⇌ 10—14 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, curvata, ampullacea, 13—19 ⇌ 6—9 μ, collo suberecto, 3—4 μ cr. Setae nullae. Perithecia dispersa, atra, globosa, verrucosa, usque ad 170 μ diam. Sporae atrobrunneae, ellipsoideae, obtusae, 4-septatae, constrictae 42—49 ⇌ 19—22 μ. Cellulis parietis perithecii obtuse conoideis vel mammillatibus, usque ad 25 μ alt.

Hab. in foliis *Mendonciae coccineae,* Sta. Catharina, Brazil, U l e, Herb. brasil. 91; Rabh. Fung. europ. 3853.

These specimens were found in Herb. Stockholm sub *Meliola obesa* Speg.; duplicates are in Herb. Kew, and I am indebted to Mr. R. S a n d w i t h of that institution for the determination of the host.

(373) *Irene plebeja* (Speg.) Th. + Syd., var. **asperrima** (Speg.) Hansf., comb. nov. (3101. 4230).

Syn.: *Meliola plebeja* var. *asperrima* Speg., Bol. Acad. Cient. Cordoba, **11**, 239. 1889. — *Irenina plebeja* var. *asperrima* (Speg.) Stev., Ann. Mycol., **25**, 453. 1927.

On *Solanaceae* indet., Apiahy, Brazil, P u i g g a r i 1551. The copy of this collection in Herb. Paris has been examined: —

Colonies amphigenous, to 1 mm. diam., thin to subdense, smooth. Mycelium of undulate, dark brown hyphae 6—8 μ wide, the cells mostly 20—30 μ long, branching alternate, acute, loosely radiating-reticulate. Capitate hyphopodia alternate, somewhat antrorse, straight or bent, 20—33 μ long; stalk cell cylindric, 5—14 μ long; head cell rounded-angulose to shallowly lobate, 13—20 ⇌ 12—16 μ. Mucronate hyphopodia oneseparate hyphae, opposite or alternate, ampulliform, 20—28 ⇌ 7—9 μ, the neck upturned, elongate, 3 μ thick. Setae none. Perithecia in loose central group, black, globose, to 230 μ diam., the surface cells obtusely conoid, to 20 μ high. Spores dark brown, cylindric, obtuse, 4-septate, constricted, 38—44 ⇌ 15—17 μ.

(374) *Irene plebeja* (Speg.) Th. & Syd., Ann. Mycol. **15**, 461. 1917. (3101. 4230).

Syn.: *Meliola plebeja* Speg., Bol. Acad. Sci. Cordoba, **11**, 238. 1889. — *Irenina plebeja* (Speg.) Stev., Ann. Mycol. **25**, 453. 1927.

Colonies hypophyllous, 2—3 mm. diam., not usually confluent, smooth. Mycelium of undulate, dark brown hyphae 7—9 μ thick, the cells mostly 20—25 μ long, branching alternate at acute angles, loosely wavy-reticulate. Capitate hyphopodia alternate, subantrorse, 19—24 μ long, usually straight; stalk cell cuneate to cylindric, 5—9 μ long; head cell subglobose to rounded-angulose, 13—16 ⇌ 12—15 μ. Mucronate hyphopodia in centre, mixed with a few capitate, alternate or opposite, ampulliform, 18—28 ⇌ 7—8 μ, neck upturned, elongate, 3 μ thick. Setae none. Perithecia loosely grouped in centre of colony, black, globose, verrucose, to 240 μ diam., the surface cells obtusely conoid, up to 28 μ high. Spores dark brown, cylindric, obtuse, 4-sept., constricted, 37—43 ⇌ 14—16 μ.

On *Solanaceae* indet., Apiahy, Brazil, P u i g g a r i 2759, in Herb. Paris.

(375) **Irene pseudekebergiae** Hansf., sp. n. (3102. 32x0).

Plagulae epiphyllae, usque ad 2 mm. diam., subdensae, leves. Mycelium ex hyphis atrobrunneis, rectis, 6—7 μ cr., cellulis plerumque 15—25 μ longis, opposite acuteque ramosis, subdense reticulatis compositum. Hyphopodia capitata opposita, leniter antrorsa, subrecta, 12—16 μ longa, cellula basali cylindracea, 2—4 μ longa, cellula apicali cylindracea apice rotundata, 9—12 ⇌ 7—8 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 15—20 ⇌

6—7 μ collo suberecto 3—4 μ cr. Setae nullae. Perithecia dispersa, atra, globosa, verrucosa, immatura. Sporae atrobrunneae, subellipsoideae, obtusae, 4-septatae, leniter constrictae, 35—39 ⇌ 15—16 μ.

Hab. in foliis *Meliacearum* spec. indet., Paraguay, B a l a n s a 4761 p. p., in Herb. Stockholm, ex B r e s a d o l a.

In this specimen this species occurs mixed wiht *Irene ekebergiae* var. *paraguayensis* Hansf. The mycelium closely resembles that of *Meliola ekebergiae* Hansf., but is devoid of setae.

(376) **Meliola aglaina** Hansf., sp. nov. (3112. 3221).

Plagulae epiphyllae, usque ad 2 mm. diam., densae, leves. Mycelium ex hyphis atrobrunneis subrectis, 6—8 μ cr., cellulis plerumque 10—20 μ longis, opposite ramosis, dense reticulatis compositum, subsolidum. Hyphopodia capitata opposita, leniter antrorsa, recta vel curvula, 13—18 μ longa; cellula basali cuneata, 3—5 μ longa; cellula apicali cylindracea vel subclavata, recta vel curvula, apice late rotundata, integra, 9—14 ⇌ 6—8 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 15—22 ⇌ 6—8 μ, collo suberecto, 3 μ cr. Setae myceliales paucae, juxta perithecia evolutae, saepe nullae, erectae, rectae, simplices, acutae, usque ad 290 ⇌ 7—9 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 160 μ diam. Sporae ellipsoideae, obtusae, atrobrunneae, 4-sept., constrictae, 32—37 ⇌ 16—18 ⇌ 12—13 μ.

Hab. in foliis *Aglaiae* spec. indet., Taytay, Palawan, Philippines, Phil. Bur. Sci. 8884 p. p.

In the type in Herb. Stockholm the above occurs mixed with *Meliola parvula* Syd.

(377) *M e l i o l a b a l a n s a e* Gaill., Le Genre *Meliola,* 1892, p. 95. (31^1/$_2$1. 5332).

The type, B a l a n s a 4018, on unknown host, Paraguay, in Herb. Paris, has been examined: —

Colonies epiphyllous, dense, to 5 mm. diam. or confluent, velvety. Mycelium of substraight dark brown hyphae 8—9 μ thick, the cells mostly 15—25 μ long, branching opposite at acute angles, densely reticulate-radiating. Capitate hyphopodia alternate, antrorse, straight or slightly bent, 24—33 μ long; stalk cell cuneate or cylindric, 6—10 μ long, head cell cylindric with widely rounded apex, entire, 18—23 ⇌ 10—15 μ. Mucronate hyphopodia few, on separate hyphae, opposite or alternate, bent ampulliform, 18—24 ⇌ 6—8 μ, neck upturned 3 μ thick. Mycelial setae closely scattered, erect, simple, up to 350 ⇌ 8—10 μ, the upper half uncinate to irregularly curved, not straight, apex acute when fully mature. Perithecia scattered, black, globose, verrucose, up to 260 μ diam. Spores dark brown, cylindric, obtuse, 4-septate, constricted, 48—59 ⇌ 22—26 μ.

Many colonies have few or even no setae.

(378) *Meliola bignoniacearum* Stev. var. **major** Hansf., var. nov. ($31^1/_3 1.$ 4221).

Plagulae hypophyllae, subdensae, usque ad 10 mm. diam. Mycelium ex hyphis subrectis, atrobrunneis, 7—8 μ crassis, cellulis plerumque 15—30 μ longis, opposite lateque ramosis, dense reticulato-intertextis compositum. Hyphopodia capitata alternata, recta vel curvata, patentia, 15—25 μ longa; cellula basali cylindracea, 3—10 μ longa; cellula apicali ovata vel cylindracea, apice late rotundata, integra, recta vel curvata, 11—18 ⇌ 9—12 μ. Hyphopodia mucronata numerosa, illis capitatis commixta, opposita vel alternata, ampullacea, 16—25 ⇌ 8—9 μ, collo elongato, suberecto, 3 μ cr. Setae myceliales tenuiter dispersae, erectae, rectae, simplices, obtusae, raro apice rugulosae vel multi-dentatae usque ad 4 μ, usque ad 270 ⇌ 7—8 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 170 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 38—44 ⇌ 14—16 μ.

Hab. in foliis *Bignoniacearum* spec. indet., Tumatumari, Brit. Guiana, Stevens 105 in Farlow Herb.

(379) *Meliola bignoniacearum* Stev. var. **parasitica** Hansf., var. nov. (3131. 4221).

Plagulae epiphyllae, densae, usque ad 1,5 mm. diam., in maculas aureas vel rufo-brunneas insidentes, subvelutinae. Mycelium ex hyphis atrobrunneis, subrectis vel undulatis, 5—7 μ crassis, cellulis plerumque 15—20 μ longis, opposite lateque ramosis, dense reticulatis compositum. Hyphopodia capitata alternata, subantrorsa, recta vel curvata, 15—20 μ longa; cellula basali cylindraceae vel cuneata, 3—6 μ longa, cellula apicali ovata vel cylindracea, apice rotundata, integra vel leniter angulosa, 12—15 ⇌ 9—11 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 13—18 ⇌ 6—7 μ, collo suberecto, 3 μ cr. Setae myceliales dispersae etiam juxta perithecia aggregatae, erectae, suberectae, usque ad 250 ⇌ 7—9 μ, apice 2—4-furcatae usque ad 25 μ, (saepius circa 10 μ), ramulis pluri-denticulatibus usque ad 10 μ, divergentibus. Perithecia subaggregata, atra, globosa, verrucosa, usque ad 180 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 34—40 ⇌ 14—16 ⇌ 12—14 μ.

Hab. in foliis *Bignoniacearum* spec. indet., Terecita, Ecuador, Stevens 82, typus in Herb. Farlow; Trinidad, Thaxter 7493.

(380) **Meliola chamissoae** Hansf., sp. nov. ($31^1/_3 3$, 3222).

Plagulae amphigenae, densae, usque ad 4 mm. diam., vel confluentes, tenuiter velutinae. Mycelium ex hyphis atrobrunneis, undulatis vel flexuosis, 6—7 μ cr., cellulis plerumque 12—20 μ longis, opposite lateque ramosis, dense reticulatis compositum. Hyphopodia capitata alternata vel opposita, recta vel curvata, subantrorsa, 12—17 μ

longa; cellula basali cylindracea, 2—6 μ longa; cellula apicali subglobosa vel late ovata, integra, 8—13 ≒ 7—10 μ. Hyphopodia mucronata pauca, illis capitatis commixta, plerumque alternata, ampullacea, 15—20 ≒ 7—8 μ, collo suberecto, 3 μ cr. Setae myceliales dispersae etiam juxta perithecia aggregatae, erectae, rectae, usque ad 350 ≒ 7—8 μ, apice saepius 2-dentatae usque ad 10 μ diam. Perithecia dispersa, atra, globusa, verrucosa, usque ad 170 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 29—36 ≒ 12—14 μ.

Hab. in foliis *Chamissoae altissimae,* Tela, Honduras, Standley 55274 (typus in Farlow Herb.).

This is the first record of *Meliola* on *Amarantaceae.*

(381) **Meliola colombiensis** Hansf., sp. nov. ($31^1/_3$. 3223).

Plagulae amphygenae, usque ad 3 mm. diam., densae, velutinae. Mycelium ex hyphis atrobrunneis 5—7 μ crassis, cellulis plerumque 13—20 μ longis, undulatis vel flexuosis, opposite denseque ramosis, reticulatis compositum. Hyphopodia capitata opposita vel alternata, patentia vel antrorsa, recta vel curvata, 10—14 μ longa; cellula apicali subglobosa vel late ovata, integra, 7—11 ≒ 7—9 μ; cellula basali cylindracea, 2—4 μ longa. Hyphopodia mucronata illis copatatis commixta, opposita vel alternata, ampullacea, 13—20 ≒ 7—8 μ, collo suberecto, 3 μ cr. Setae myceliales numerosae, dispersae, etiam juxta perithecia aggregatae, erectae, rectae, simplices vel varie dentatae usque ad 15 μ, usque ad 950 ≒ 8—10 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 180 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, leniter constrictae, 32—37 ≒ 12—13 ≒ 10—12 μ.

Hab. in foliis *Solani* spec. indet., prope Ciudad Mutis Colombia, Killip & Garcia 33609 (typus in Farlow Herb.).

The mycelial setae are very variable: the longer ones are scattered over the mycelium and are usually simple, obtuse to acute, while shorter ones are grouped around the perithecia and are very irregularly dentate.

(382) *Meliola cymbisperma* Mont., Ann. Sci. Nat. **2**: **20**, 374. 1843. (3113. 5333).

Type on *Smilax globifera,* Surinam, Splitgerber 1262, in Herb. Paris: —

Colonies epiphyllous, to 5 mm. diam. or confluent and larger, dense, heavily parasitised by *Helminthosporium* and *Meliolinopsis.* Mycelium of substraight dark brown hyphae 7—10 μ thick, the cells mostly 18—25 μ long, branching usually opposite at wide angles, loosely to closely reticulate. Capitate hyphopodia alternate or opposite in varying proportions, spreading or antrorse, straight or bent, 18—24 μ long; stalk cell cylindric, 3—6 μ long; head cell subglobose to cylindric with rounded apex, entire, 13—18 ≒ 9—12 μ. Mucronate hyphopodia not seen. Mycelial setae obscured by conidiophores of the

parasite; straight, simple, acute, up to 650 ⇌ 10 μ. Perithecia scattered, black, globose, verrucose, to 240 μ diam. Spores dark brown, cylindric to subellipsoid, obtuse, 4-septate, slightly constricted, 50—56 ⇌ 19—20 μ.

(383) *Meliola decidua* Speg., Bot. Acad. Sci. Cordoba, **11**, 240. 1889. (3113. 5222).

The Herb. Paris copy of the type, Puiggari 2344, on ? Convolvulaceae indet., Brazil, has been examined: —

Colonies amphigenous, 2—5 mm. diam., dense, velvety, subcrustose, easily secedent. Mycelium of substraight dark brown hyphae 7—10 μ thick, the cells mostly 15—20 μ long, branching opposite or irregular at acute angles, densely reticulate and almost solid. Capitate hyphopodia opposite or alternate, somewhat antrorse, straight or bent, 15—27 μ long; stalk cell cylindric, 3—9 μ long; head cell rounded-angulose or sublobed, irregular, 12—21 ⇌ 11—20 μ. Mucronate hyphopodia few, mixed with capitate, opposite or alternate, ampulliform, 15—20 ⇌ 6—8 μ, neck upturned 3 μ thick. Mycelial setae numerous, closely scattered, erect, straight, simple, acute, up to 350 ⇌10—11 μ. Perithecia closely scattered, black, globose, verrucose, up to 200 μ diam. Spores cylindric with obtusely rounded ends, 4-septate, constricted, 49—54 ⇌ 15—17 μ.

(384) *Meliola effusa* Gaill., Le Genre *Meliola,* 1892, p. 91. (3111. 5223).

Type: Kegel 596 on unknown host, Paramaribo, Surinam, in Herb. Paris: —

Colonies hypophyllous, thin, to 10 mm. diam. or confluent, Mycelium of undulate to flexuous hyphae, the cells 20—30 ⇌ 5—8 μ, dark brown, branching opposite or irregular at variable angles, loosely reticulate-interwoven, becoming denser in centre. Capitate hyphopodia alternate, or very rarely (much less than 1%) opposite, straight or bent, 14—22 μ long; stalk cell cylindric, 4—8 μ long; head cell ovate to piriform, entire, often bent, 10—15 ⇌ 9—12 μ. Mucronate hyphopodia mixed with capitate, ampulliform, bent, opposite or alternate, 16—23 ⇌ 7—8 μ, the neck upturned, elongate, 3 μ thick. Mycelial setae thinly scattered and also grouped around the perithecia, erect, straight, simple, acute, up to 900 ⇌ 9—10 μ. Perithecia scattered, black, globose, up to 190 μ diam. Spores dark brown, cylindric with obtusely conoid ends, 4-septate, constricted, 50—56 ⇌ 16—18 μ.

In some characters this resembles *Meliola psidii* Fr., but the spores are much larger and the setae fewer and longer; the host leaf is not *Psidium guajava.*

(385) **Meliola eugeniae-jamboloidis** Hansf. var. **paulensis** Hansf., var. n. (3111. 4233).

Plagulae epiphyllae, densae, usque ad 5 mm. diam., vel late confluentes, subleves. Mycelium ex hyphis atrobrunneis, subrectis, 7—9 μ cr., cellulis plerumque 25—30 μ longis, opposite vel irregulariter acuteque ramosis, dense reticulatis compositum. Hyphopodia capitata alternata vel rarissime opposita, antrorsa vel patentia, 20—28 μ longa, recta vel curvula, cellula basali cylindracea vel cuneata, 3—8 μ longa, cellula apicali cylindracea vel clavulata, integra, apice late rotundata, 13—20 ⇌ 9—11 μ. Hyphopodia mucronata pauca, illis capitatis in centro plagularum commixta, opposita vel alternata, ampullacea, 20—25 ⇌ 7—9 μ, collo suberecto, 3—4 μ cr. Setae myceliales haud numerosae, dispersae etiam juxta perithecia aggregatae, erectae, simplices, acutae, rectae, usque ad 600 ⇌ 9—11 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 210 μ diam. Sporae cylindraceae, obtusae, atrobrunneae, 4-septatae, constrictae, 42—47 ⇌ 16—17 μ.

Hab. in foliis *Myrtacearum* spec. indet., Sao Paulo, Brazil, Usteri 51 in Herb. Stockholm, ex Rehm, sub *Meliola obesa* Speg.

(386) *Meliola evanida* Gaill., Le Genre *Meliola,* 1892, p. 102. (31^1/$_3$1. 4224).

Type: on *Strychnos* sp., Loango, Angola, leg. Thollon, in Herb. Paris: —

Colonies hypophyllous, up to 10 mm. diam. or confluent, thin. Mycelium of brown hyphae 5—7 μ thick, the cells mostly 30—35 μ long, slightly undulate, branching opposite or irregular at acute angles, loosely reticulate. Capitate hyphopodia alternate, more or less bent, 21—29 μ long, spreading or somewhat antrorse; stalk cell cylindric, 5—8 μ long, often bent; head cell cylindric with rounded apex, entire, usually bent, 15—20 ⇌ 7—9 μ. Mucronate hyphopodia numerous, mixed with the capitate, alternate or opposite, narrowly ampulliform, bent, 18—30 ⇌ 6—7 μ, neck elongate, upturned, 3 μ thick. Mycelial setae in loose groups around the perithecia, up to 1100 ⇌ 9—11 μ, simple and acute or 2—3-dentate to 30 μ. Perithecia scattered, black, globose, verrucose, to 150 μ diam. Spores dark brown, ellipsoid to nearly cylindric, obtuse, 4-septate, constricted, 38—45 ⇌ 14—17 ⇌ 12—13 μ.

(387) *Meliola francevilleana* Gaill., Le Genre *Meliola,* 1892, p. 88. (3113. 6231).

Type: De Brazza & Thollon 191, on *Breweria* sp., Congo Belge, in Herb. Paris: —

Colonies epiphyllous, dense, velvety, up to 4 mm. diam. Mycelium of straight dark brown hyphae 6—8 μ thick, the cells mostly 15—25 μ long, branching opposite at wide angles, becoming almost solid in the centre. Capitate hyphopodia opposite or alternate in varying proportions, straight or bent, spreading or antrorse, 13—20 μ long; stalk cell cylindric, 2—6 μ long; head cell globose to piriform, entire,

10—13 ⇌ 8—12 μ. Mucronate hyphopodia mixed with the capitate on few hyphae, opposite or alternate, bent ampulliform, 13—19 ⇌ 7—9 μ, neck suberect, 3 μ thick. Mycelial setae numerous, erect, straight, simple, acute, up to 280 ⇌ 9—10 μ. Perithecia scattered, black, globose, verrucose, up to 210 μ diam. Spores dark brown, cylindric, obtuse, 4-septate, slightly constricted, 53—61 ⇌ 16—17 μ, the middle cell usually the largest.

(388) *Meliola forbesii* Gaill., Le Genre *Meliola,* 1892, p. 110. (3143. 3221).

Type: Forbes 2893, on unknown host, Sumatra, in Herb. Paris; the host leaf has a long drip-tip like some species of *Jasminum,* or it could be the leaflet of some leguminous or Meliaceous plant: —

Colonies epiphyllous, thin, smooth, to 2 mm. diam. Mycelium of straight dark brown hyphae 7—10 μ wide, the cells mostly 25—35 μ long, branching opposite at acute angles, loosely radiating-reticulate. Capitate hyphopodia alternate or about 5% opposite, more or less antrorse, straight or bent, 16—20 μ long; stalk cell cuneate, 4—7 μ long; head cell subglobose to ovoid, entire, 12—14 ⇌ 10—12 μ. Mucronate hyphopodia mixed with the capitate, rather few, opposite or alternate, ampulliform, 19—25 ⇌ 8—10 μ, the neck upturned, 3 μ thick. Mycelial setae not seen — few colonies now remain on the material and all are denuded of setae, which Stevens in Ann. Mycol. **25**, 175, 1927, gave as "1—2-dichotomous, the upper secondary branch 3-dichotomous, lower usually simple". Perithecia and spores were not seen in my mounts.

(389) *Meliola furcata* Lev., Ann. Sci. Nat. Bot., III: **5**, 266. 1846.

The type specimen of this species is Kegel 595 on *Cissus* sp., Surinam, and is the only specimen in Herb. Paris from Léveillé: —

Colonies mostly epiphyllous, dense, to 3 mm. diam. or confluent, velvety. Mycelium of subtraight to undulate dark brown hyphae 7—8 μ thick, the cells mostly 15—25 long, branching alternate or irregular at acute angles, closely reticulate-radiating. Capitate hyphopodia alternate, more or less antrorse, straight or bent, mostly 17—25 μ long, abnormally up to 35 μ; stalk cell cylindric-cuneate, 6—12 μ long; head cell from subglobose and entire to shallowly and irregularly rounded-lobate, often bent, 13—18—(24) ⇌ 10—16 μ. Mucronate hyphopodia few, on separate hyphae in centre, opposite or alternate, ampulliform, 12—16 ⇌ 7—8 μ, neck upturned, 3 μ thick. Mycelial setae fairly numerous, scattered, erect, straight, up to 240 ⇌8—10 μ, opaque, the apex divided into 2—3 spreading short branches up to 20 μ long and these again dichotomous or 2-dentate to 20 μ. Perithecia subaggregate in centre, black, globose, verrucose, to 210 μ diam. Spo-

res dark brown, cylindric, obtuse, 4-septate, slightly constricted, 36—42 ⇌ 14—15 ⇌ 11—13 μ.

Comparing this with records of other species of the genus on *Vitaceae,* I find that it is identical with *M. merrillii* Syd., as instanced by the specimens Phil. Bur. Sci. 8672 (type); 23885 and 24017, all on *Cissus* spp., Philippines; and with the following collections on *Cissus sicyoides:* Cuba, Wright 393; Nicaragua, Wright 548 b; Para, Brazil, Heber, in Herb. Stockholm; on *Cissus* sp., S. Catharina, Brazil, Ule, Herb. brasil. 981; on *Vitis* sp., S. Maria de Data, Costa Rica, Tonduz in Herb. Stockholm.

South African specimens on *Rhoicissus rhomboidea,* described by Doidge and Sydow in Bothalia **2**, 447, 1928, are more or less identical with the above, but Hansford's Uganda collections on *Rhoicissus revoilii* (nos. 2787, 2812, 3176, 3416, 3607) differ markedly in the close and irregular branching of the setae, presenting a more or less cristate appearance; for these the new variety *ugandensis* is proposed: —

Meliola furcata Lev. var. **ugandensis** Hansf., var. n.

Ab typo: differt: setae myceliales dense cristato-furcatae, ramulis subdivergentibus, usque ad 15 μ longis, varie dentatis usque ad 6 μ.

Hab. in foliis *Rhoicissi revoilii,* Entebbe Road, Uganda, Hansford 2787, typus.

A tradition has grown up, apparently commencing with Patouillard, Rev. Mycol. **10**, 135, 1888, that *Meliola furcata* Lev. occurs on palms, and many records have been made of such. All these are incorrect, and refer to one or other of species with more or less dichotomous setae, limited to palm leaves. I have not yet examined authentic material of *M. morrowi* Stev. nor of *M. melanococcae* Stev., so am unable to pronounce as to how many of the specimens previously referred by other workers and myself to *M. furcata* should be emended and placed in these species or as *M. elaeis* Stev., or whether it may be necessary to describe yet another new species to contain them.

(390) **Meliola herteri** Hansf., sp. nov. (3131. 4221).

Plagulae amphigenae, densae, velutinae, usque ad 2 mm diam. Mycelium ex hyphis subrectis, atrobrunneis, 7—9 μ crassis, cellulis plerumque 15—25 μ longis, opposite acuteque ramosis, dense radiantoreticulatis compositum. Hyphopodia capitata alternata, antrorsa, plus minusve recta, 20—28 μ longa; cellula basali cuneata vel cylindracea, 5—9 μ longa; cellula apicali cylindracea, apice late rotundata, interdum late ovata, 15—20 ⇌ 9—12 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 15—25 ⇌ 7—9 μ, collo suberecto, 4 μ cr. Setae myceliales numerosae, dispersae, erectae, rectae, usque ad 240 ⇌ 7—9 μ, apice saepius breviter 2—4-furcatae

usque ad 14 μ, ramulis 2—3-dentatis usque ad 10 μ. Perithecia dispersa vel in centro plagularum subaggregata, atra, globosa, verrucosa, usque ad 180 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 41—45 ⇌ 15—18 μ.

Hab. in foliis *Bignoniae unguis-cati,* Rio Verde, Chaco, Paraguay, Herter 85137 in Farlow Harb.

The mycelium resembles that of *M. bidentata* Cooke, but the setae are quite different.

(391) *Meliola heudelotii* Gaill., Le Genre *Meliola* 1892, p. 49. (31½1. 4323).

Syn.: *Irenina heudelotii* (Gaill) Stevens, Ann. Mycol. **24**, 458. 1926.

Type: On *Memecylon* sp., Senegambia, Rio Tongos, 1837, leg. Heudelot, in Herb. Paris:

Little of the type specimen now remains. Colonies epiphyllous, thin, to 2 mm diam. or confluent. Mycelium of substraight dark brown hyphae 7—8 μ thick, the cells mostly 20—30 μ long, branching opposite at acute angles, loosely reticulate. Capitate hyphopodia alternate, very rarely opposite, spreading, 15—23 μ long; stalk cell cylindric, 3—5 μ long; head cell cylindric with rounded apex, straight or slightly bent, 11—18 ⇌ 7—12 μ. Mucronate hyphopodia mixed with capitate, opposite or alternate, ampulliform to conoid, 15—25 ⇌ 6—8 μ, the neck upturned, 3—4 μ thick. Mycelial setae few, grouped around the perithecia, erect, more or less straight, up to 700 ⇌ 9—10 μ, the apex simple and acute or 2-dentate to 12 μ. Perithecia loosely scattered, black, globose, verrucose, immature (Gaillard gave them as 150—200 μ diam.). Spores dark brown, cylindric, obtuse, 4-septate, constricted, 42—49 ⇌ 18—20 μ.

This corresponds with Deighton M 2436 on *Memecylon* sp., Sussex, Colony, Sierra Leone in Herb. Commonwealth Mycological Institute, previously determined as *M. affinis* Syd.

(392) *Meliola insignis* Gaill., Le Genre *Meliola,* 1892, p. 44. (3113. 433x).

The type, Forbes 3045a on unknown host, Sumatra, in Herb. Paris is in poor condition, and no perithecia or mycelial setae now remain:

Colonies epiphyllous, thin, to 2 mm diam., smooth, heavily parasitised by *Arthrobotryum.* Mycelium of straight dark brown hyphae 7—8 μ thick, the cells mostly 15—25 μ long, branching usually opposite at wide angles, loosely reticulate. Capitate hyphopodia alternate or opposite in variable proportions, more or less antrorse, straight, 18—25 μ long; stalk cell cylindric, 3—6 μ long; head cell cylindric with rounded apex, sometimes clavulate, entire, 13—20 ⇌ 8—10 μ. Mucronate hyphopodia not seen. No mycelial setae were found;

Stevens in Ann. Myc. **25**, 166, 1927, gave them as simple and obtuse, 250—350 μ long, but these may not have referred to this specimen. Perithecia scattered, only the empty sites now remaining; Gaillard gave them as up to 250 μ diam. Spores dark brown, cylindric, 4-septate, constricted, 47 ≒ 20 μ (Gaillard gave them as 3-septate, 34—35 ≒ 14—15 μ, evidently an error).

In my recent examination of the large collections of Herb. Bogoriense, I did not discover any species exactly corresponding with the above, which needs re-collection to establish its identity, as also that of the host plant.

(393) *Meliola lanosa* Pat., Rev. Mycol., **10**, 136. 1888. (2111. 6342).

Syn.: *M. funerea* McAlpine, Proc. Linn. Soc. N.S.W., **21**, 104. 1896. — *M. negeriana* Syd. Ann. Mycol. 2, 170, 1904. — *M. macrocarpa* Mont. in Herb. Mus. Paris, p. p.

The type is on *Lomatia* sp., Chile, in Herb. Paris:

Colonies amphigenous, dense, velvety, crustose, up to 4 mm diam. Mycelium of crooked dark brown hyphae 7—8 μ thick, the cells 20—35 μ long, branching opposite or irregular at acute angles, densely reticulate-interwoven. Capitate hyphopodia alternate, straight or more often irregularly bent, 23—38 μ long; stalk cell cylindric, 6—22 μ long; head cell ovate to irregularly rounded-angulose or shallowly rounded-lobate, often bent, versiform, 15—21 ≒ 10—15 μ. Mucronate hyphopodia not seen. Mycelial setae numerous, scattered, erect, more or less straight, simple, obtuse to subacute, up to 400 ≒ 9—10 μ. Perithecia scattered or loosely aggregate, black, globose, verrucose, to 310 μ diam. Spores dark brown, slightly bent-fusoid, 3-septate, constricted 60—68 ≒ 20—23 μ, the ends obtuse.

(394) *Meliola laxa* Gaill., Bull. Soc. Myc. France, **8**, 179. 1892. (3111. 3221).

Type: on *Myrtaceae* indet., Ecuador, 1892, leg. Lagerheim, in Herb. Paris:

Colonies amphigenous, to 3 mm diam. or widely confluent, thin, smooth. Mycelium of more or less undulate, dark brown hyphae 7—10 μ thick, the cells mostly 20—30 μ long, branching alternate or irregular at acute angles, loosely reticulate. Capitate hyphopodia alternate, more or less antrorse, straight or bent, 18—25 μ long; stalk cell cylindric, 5—8 μ long; head cell ovate to clavate, widely rounded at the apex or sometimes slightly irregularly rounded-lobate, 13—18 ≒ 10—13 μ. Murronate hyphopodia mostly on separate hyphae in centre of colony, rather few, opposite or alternate, ampulliform, 16—20 ≒ 6—8 μ, the neck upturned, 3 μ thick. Mycelial setae very few, almost all grouped around the perithecia, erect, straight or somewhat bent, not uncinate, simple, obtuse to subacute, up to 280 ≒ 7—9 μ. Peri-

thecia scattered, black, globose, verrucose, immature, to 150 μ diam. Spores dark brown, cylindric, obtuse, 4-septate, constricted, 36—39 ⇌ 14—15 μ.

The specimen on *Eugenia guaviyu,* Argentine, Bompland, described by Spegazzini in Annal. Mus. Nac. Buenos Aires, **25**, 43, 1912, seems to differ widely in colony characters and has larger spores; I consider it to be a different species though I have not seen the specimen.

(395) *Meliola leptospora* Gaill., Le Genre *Meliola,* 1892, p. 87. (3111. 4222).

Type on *Marantaceae* indet., Congo, Thollon 1207 in Herb. Paris:

Colonies mostly hypophyllous, to 15 mm diam. or confluent thin to subdense, velvety. Mycelium of substraight to flexuous dark brown hyphae 5—8 μ thick, the cells mostly 25—40 μ long, branching opposite or irregular at acute angles, loosely to closely reticulate-interwoven. Capitate hyphopodia alternate, unilateral or more scattered, straight or irregularly bent, 17—22 μ long; stalk cell cylindric to cuneate, 5—10 μ long; head cell subglobose, entire, 10—13 ⇌ 8—13 μ. Mucronate hyphopodia few, scattered amongst the capitate, alternate, ampulliform to lageniform, 15—20 ⇌ 6—7 μ, the neck upturned, 3 μ thick. Mycelial setae numerous, closely scattered, erect, more or less straight, simple, acute, up to 450 ⇌ 8—9 μ, gradually attenuate to the apex. Perithecia scattered, black, globose, verrucose, to 160 μ diam. Spores dark brown, cylindric, obtuse, 4-septate, slightly constricted, 39—48 ⇌ 11—13 μ.

(396) *Meliola moerenhoutiana* Mont. in Sagra, Hist. Cuba, p. 327. 1842. (3111. 3221).

Type on *Alyxia stellata,* Tahiti, leg. Moerenhout. In Herb. Paris are three sheets, labelled:

a) *M. moerenhoutiana* Mont., Otahiti, ex Bertero,

b) *M. moerenhoutiana* Mont., on *Alyxia stellata,* Otahiti, ex Leveille.

c) without locality, and det. Gaillard as *M. amphitricha* Fr.

All these are undoubtedly on the same host, and appear to be parts of the original type collection:

Colonies amphigenous, to 2 mm diam., dense, velvety. Mycelium of substraight dark brown hyphae 5—7 μ thick, the cells mostly 10—15 μ long, branching opposite or irregular at wide angles, closely reticulate and becoming almost solid. Capitate hyphopodia alternate, slightly antrorse, straight or bent, 14—20 μ long; stalk cell cylindric, 3—7 μ long; head cell versiform, from wide ovate to cylindric with rounded or slightly clavate apex, or sinuous-bent and somewhat rounded-angulose, 9—15 ⇌ 6.5—9 μ. Mucronate hyphopodia on sepa-

rate hyphae, mostly opposite, ampulliform, 10—15 ⇌ 7—8 μ, with short upturned neck 3 μ thick. Mycelial setae numerous, erect, straight, simple, acute, up to 280 ⇌ 7—8 μ. Perithecia scattered, black, globose, verrucose, up to 140 μ diam. Spores dark brown, cylindric, obtuse, 4-septate, constricted, 34—39 ⇌ 15—16 μ.

This is quite distinct from *M. alyxiae* Stevens, though Stevens suggested their being the same; in Sylloge Fungorum the spores are given in error as 3-septate.

(397) *Meliola monilispora* Gaill., Le Genre *Meliola,* 1892, p. 101. (3131. 4331).

Type: On probably Apocynaceous host (?*Strophanthus* sp.), Nyaru, Congo, Thollon, June 1888, in Herb. Paris:

Colonies amphigenous, mostly hypophyllous, black, to 2 mm diam., dense. Mycelium of substraight dark brown hyphae 7—9 μ thick, the cells mostly 10—17 μ long, branching usually opposite at wide angles, closely reticulate and almost solid in centre. Capitate hyphopodia alternate, straight or bent, more or less antrorse, 20—28 μ long; stalk cell cylindric to cuneate, 4—9 μ long; head cell widely ovate to piriform, entire, 15—19 ⇌ 10—15 μ. Mucronate hyphopodia numerous, mixed with few capitate, opposite or alternate, ampulliform to conoid, 15—24 ⇌ 7—9 μ, neck upturned 3—4 μ thick. Mycelial setae fairly numerous, erect, scattered, straight, to 280 μ long by 9—10 μ wide at base, apex 2—6-dentate, the teeth rather obtuse and to 9 μ long. Perithecia scattered, black, globose, verrucose, to 210 μ diam. Spores dark brown, broadly ellipsoid, 4-septate, constricted, 42—49 ⇌ 19—23 ⇌ 15—16 μ.

Hansford 1969 on Apocynaceae indet., Mukono Forest, Kiagwe, Uganda, appears to belong to this species.

(398) *Meliola montagnei* Pat. in Gaillard, Le Genre *Meliola,* 1892, p. 85. (3113. 5221).

Type on *Salacia* sp., Reunion in Herb. Paris, ex Herb. Petit-Thouars:

Colonies amphigenous, dense, black, to 2 mm diam. Mycelium of dark brown, substraight hyphae 7—8 μ thick, the cells mostly 12—20 μ long, branching opposite or irregular, closely radiating-reticulate. Capitate hyphopodia alternate or about 10% opposite, straight or antrorse-bent, 16—22 μ long; stalk cell cuneate to cylindric, 3—10 μ long; head cell globose to widely piriform, entire, broadly rounded at apex, 11—15 ⇌ 9—14 μ. Mucronate hyphopodia rather few, on separate hyphae in centre of colony, opposite or alternate, bent ampulliform, 15—21 ⇌ 6—8 μ, neck upturned, 3—4 μ thick. Mycelial setae scattered, erect, straight, simple, acute, up to 200 ⇌ 8—10 μ. Perithecia scattered, black, globose, verrucose, to 190 μ diam. Spores dark

brown, cylindric, obtuse, 4-septate, rather deeply constricted, 52—58 ⇌ 17—20 μ.

(399) *Meliola opiliae* Syd., var. **singalensis** Hansf., var. n. (3113. 4223).

Plagulae amphigenae, plerumque epiphyllae, usque ad 3 mm diam., atrae, densae, velutinae. Mycelium ex hyphis atrobrunneis, rectis, 6—8 μ cr., cellulis plerumque 13—24 μ longis, opposite acuteque ramosis, dense reticulatis compositum. Hyphopodia capitata alternata vel usque ad 90% opposita, subantrorsa, recta vel curvula, 12—20 μ longa, cellula basali cylindracea, 2—6 μ longa, cellula apicali subglobosa vel piriformi, integra, apice late rotundata, 10—15 ⇌ 8—11 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 16—23 ⇌ 7—9 μ, collo elongato suberecto 3 μ cr. Setae myceliales numerosae, dispersae, etiam juxta perithecia aggregatae, erectae, rectae, simplices, acutae, usque ad 600 ⇌ 9—10 μ. Perithecia subaggregata, atra, globosa, verrucosa, usque ad 190 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 39—47 ⇌ 16—17 ⇌ 13—15 μ.

Hab. in foliis *Cansjerae rheedii,* Ceylon, Thwaites 497 p. p., in Herb. Kew.

(400) **Meliola osmanthicola** Hansf., sp. n. (3111. 53x2).

Plagulae epiphyllae, densae, usque ad 3 mm diam. Mycelium ex hyphis subrectis, atrobrunneis, 7—8 μ cr., cellulis plerumque 20—25 μ longis, opposite acuteque ramosis, dense reticulatis compositum. Hyphopodia capitata alternate, plus minusve antrorsa, recta vel curvata, 23—38 μ longa, cellula basali cuneata vel cylindracea, 7—12 μ longa, cellula apicali curvato-cylindracea vel irregulariter clavata et sublobata, 18—28 ⇌ 9—12 μ. Hyphopodia mucronata saepius in hyphis distinctis evoluta, ampullacea, opposita vel alternata, 15—24 ⇌ 7—9 μ, collo suberecto 3—4 μ cr. Setae myceliales dispersae, erectae, rectae, simplices, acutae, usque ad 500 ⇌ 7—9 μ. Perithecia dispersa, atra, globosa, immatura. Sporae atrobrunneae, cylindraceae, obtusae, constrictae, 4-septatae, 45—50 ⇌ 22 μ.

Hab. in foliis *Osmanthi sandwicensis,* Oahu, Hawaii, Stevens 513 in Herb. Stockholm, ex U.S.D.A. 71000.

(401) **Meliola osmanthina** Hansf., sp. n. (3111. 42x3).

Plagulae hypophyllae, tenues, usque ad 3 mm diam. vel confluentes. Mycelium ex hyphis atrobrunneis, subrectis vel flexuosis, 5—6 μ cr., cellulis plerumque 20—30 μ longis, opposite vel irregulariter lateque ramosis, laxe reticulato-intertextis compositum. Hyphopodia capitata alternata, recta vel curvula, subantrorsa, 18—37 μ longa, cellula basali cylindracea, 5—15 μ longa, cellula apicali cylindracea, apice rotundata vel subattenuata, saepius irregulariter curvata vel rotundato-angulosa, 15—22 ⇌ 6—8 μ. Hyphopodia mucronata in hyphis

distinctis evoluta, opposita vel alternata, tenuiter ampullacea, 15—22 ⇌ 6—7 μ, collo suberecto 3—4 μ cr. Setae myceliales dispersae, erectae, rectae, simplices, acutae, usque ad 600 ⇌ 8—9 μ. Perithecia dispersa, atra, globosa, verrucosa, immatura. Sporae atrobrunneae, ellipsoideae, obtusae, 4-septatae, constrictae, circa 45 ⇌ 20 μ.

Hab. in foliis *Osmanthi sandwicensis,* Oahu, Hawaii, S t e v e n s 513, in Herb. Stockholm, ex U.S.D.A. 71000.

This and the preceding species occur mixed on the same leaves; they are easily distinguished by colony and mycelial characters.

(402) *M e l i o l a p a r a e n s i s* P. Henn., Hedwigia **39**, 77. 1900. (3111. 2221).

Type on *Vitex* sp., Para, H u b e r 4 in Herb. Stockholm, ex Herb. Berlin:

Colonies amphigenous, thin, to 5 mm diam. or confluent. Mycelium of epiphyllous colonies straight, more crooked on lower surface of leaf; hyphae dark brown, 5—6 μ wide, the cells mostly 20—30 μ long, branching opposite at acute angles, loosely reticulate-interwoven. Capitate hyphopodia alternate, straight, somewhat antrorse, 12—18 μ long; stalk cell cuneate to cylindric, 3—6 μ long; head cell globose to widely ovate, entire, 8—12 ⇌ 8—10 μ. Mucronate hyphopodia mixed with capitate or mostly on separate hyphae, opposite or alternate, ampulliform, 13—18 ⇌ 6—7 μ, neck upturned, 3 μ thick. Mycelial setae thinly scattered and also grouped around the perithecia, erect, straight or flexuous, not uncinate, simple, obtuse, up to 260 ⇌ 6—8 μ. Perithecia loosely scattered, black, globose, verrucose, up to 140 μ diam. Spores dark brown, cylindric, obtuse, 4-septate, constricted, 23—28 ⇌ 9—11 μ.

(403) *M e l i o l a p a t o u i l l a r d i i* Gaill., Le Genre *Meliola,* 1892, p. 109. (31³/₄1. 3221).

Type collection: on *Piper* sp., S. Nicolas, Ecuador, L a g e r h e i m, in Herb. Stockholm, ex P a t o u i l l a r d:

Colonies hypophyllous, to 10 mm diam., rather dense, somewhat velvety. Mycelium of sinuous to crooked dark brown hyphae 5—7 μ thick, the cells mostly 20—30 μ long, irregularly branched and reticulate-interwoven. Capitate hyphopodia alternate or more scattered, straight or bent, 12—17 μ long; stalk cell cylindric, 3—5 μ long; head cell subglobose, piriform, or ovoid, often bent, entire, 8—13 ⇌ 7—10 μ. Mucronate hyphopodia rather few, scattered amongst capitate or on separate hyphae, opposite or alternate, ampulliform or lageniform, 18—25 ⇌ 7—9 μ, neck erect, elongate to 14 ⇌ 3 μ. Mycelial setae rather numerous, scattered and grouped around the perithecia, erect, more or less straight, 160—240 ⇌ 8—10 μ, the apex with 2—4 short divergent branches to 15 μ long, and these with 2—3 teeth to 12 μ long, or the primary branches reduced and then appearing cristate with many

teeth up to 15 μ long. Perithecia scattered, black, globose, verrucose, to 190 μ diam. Spores dark brown, cylindric, obtuse, 4-septate, slightly constricted, 35—39 ⇌ 11—12.5 ⇌ 10 μ.

Ex descr. this appears to be identical with *M. zetekii* Stevens. The specimen Sydow. Fung. exot. exs. 1144, on *Piper rufescens*, Ecuador appears also to belong here, and is apparently on the same host as the type; the setal branching is rather more condensed than in the type. This specimen was also issued as Sydow. Fung. Aequator. 250.

(404) *Meliola perexigua* Gaill., Le Genre *Meliola*, 1892, p. 98. ($31^1/_3$1. 3221).

Type: on unknown host, Congo Francaise, Thollon, in Herb. Paris:

Colonies hypophyllous, thin, diffuse and widely confluent, almost smooth. Mycelium of substraight dark brown hyphae 5—6 μ thick, the cells mostly 25—30 μ long, loosely reticulate, becoming interwoven and closer. Capitate hyphopodia alternate, more or less antrorse, 12—16 μ long; stalk cell cylindric, 3—6 μ long; head cell ovate, entire, widely rounded at apex, 9—12 ⇌ 7—8 μ. Mucronate hyphopodia rare, alternate, mixed with capitate, 14—18 ⇌ 6—7 μ, neck upturned, 3 μ thick. Mycelial setae few, scattered and grouped around the perithecia, erect, straight, simple and acute or more rarely 2—3-dentate to 7 μ, up to 270 ⇌ 6—8 μ. Perithecia few, scattered, black, globose, verrucose, to 150 μ diam. Spores dark brown, cylindric, obtuse, 4-septate, constricted, 28—33 ⇌ 11—12 ⇌ 8—9 μ.

(405) **Meliola petitiae** Hansf., sp. n. (3111. 4221).

Plagulae epiphyllae, usque ad 5 mm diam. vel confluentes, tenues. Mycelium ex hyphis atrobrunneis, undulatis, 6—7 μ cr., cellulis plerumque 25—30 μ longis, opposite vel irregulariter lateque ramosis, laxe reticulato-intertextis compositum, Hyphopodia capitata alternata, antrorsa vel patentia, recta vel curvata, 25—34 μ longa, cellula basali cylindracea vel cuneata, 7—15 μ longa, cellula apicali ovata vel tenuiter clavata, integra, 14—20 ⇌ 10—14 μ. Hyphopodia mucronata in hyphis distinctis evoluta, dense conferta, plerumque opposita, ampullacea, 13—19 ⇌ 6—9 μ, collo suberecto, curvato, 3—4 μ cr. Setae myceliales tenuiter dispersae, etiam juxta perithecia aggregatae, erectae, subrectae, simplices, obtusae, usque ad 250 ⇌ 7—8 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 140 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-sept. constrictae, 35—40 ⇌ 14—15 μ.

Hab. in foliis *Petitiae domingensis*, S. Domingo, Ciferri 2822 in Herb. Stockholm.

(406) **Meliola plectroniae** Hansf., sp. n. (3111. 4223).

Plagulae hypophyllae, tenues, subvelutinae, usque ad 5 mm diam. Mycelium ex hyphis atrobrunneis, subrectis vel flexuosis, 7—9 μ cr.,

cellulis plerumque 25—40 μ longis, opposite vel irregulariter ramosis, reticulato-intertextis compositum. Hyphopodia capitata alternata, irregulariter curvata, 25—70 μ longa, cellula basali cylindracea, curvata, interdum 1—3-septata, 8—60 ⇌ 7—9 μ, cellula apicali versiformi saepe uncinata vel curvata, 13—29 ⇌ 9—18 μ, ovata et subintegra, varie angulosa vel sublobata. Hyphopodia mucronata dispersa, alternata, ampullacea, 15—23 ⇌ 7—9 μ, collo suberecto 3 μ cr. Setae myceliales dispersae, rectae, simplices, acutae, usque ad 550 ⇌ 9—10 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 180 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 41—48 ⇌ 15—18 μ.

Hab. in foliis *Plectroniae umbellatae*, Matheran, Bombay, India, in Herb. Farlow.

The long capitate hyphopodia often resemble short mycelial branches, with their septate stalks.

(407) **Meliola polyalthiae** Hansf., sp. n. (3122. 4231).

Plagulae plerumque hypophyllae, usque ad 2 mm diam., densae, crustosae, velutinae. Mycelium in epiphyllo ex hyphis atrobrunneis, 7—8 μ cr., cellulis 10—20 μ longis, opposite lateque ramosis, dense intertextis compositum, in hypophyllo subsolidum, hyphis irregulariter flexuosis. Hyphopodia capitata opposita, plus minusve antrorsa, 10—15 μ longa, cellula basali cylindracea, 2—5 μ longa, cellula apicali subglobosa, integra, 8—11 ⇌ 8—11 μ. Hyphopodia mucronata illis capitatis commixta, pauca vel numerosa, opposita vel alternata, conoidea vel ampullacea, 13—16 ⇌ 7—8 μ, collo suberecto, 3—4 μ cr. Setae myceliales numerosae, erectae, usque ad 290 ⇌ 9—11 μ, simplices, obtusae, sursum plus minusve curvatae vel uncinatae. Perithecia subaggregata, atra, globosa, verrucosa, usque ad 210 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 40—46 ⇌ 13—15 μ.

Hab. in foliis *Polyalthiae sumatranae*, Sandakan, B. N. Borneo, Forest Dept. A 2103, p. p., in Herb. Kew.

(408) *Meliola praetervisa* Gaill., var. **stevensii** Hansf., var. n. (3112. 5323).

Plagulae epiphyllae, densae, usque ad 3 mm diam. Mycelium ex hyphis atrobrunneis, subrectis, 6—9 μ cr., cellulis plerumque 12—20 μ longis, opposite lateque ramosis, dense reticulatis compositum. Hyphopodia capitata opposita, subantrorsa, recta vel leniter recurvata, 15—20 μ longa; cellula basali cylindracea 2—5 μ longa, cellula apicali obtuse conoidea, integra, 11—16 ⇌ 8—10 μ. Hyphopodia mucronata pauca, illis capitatis commixta, opposita vel alternata, ampullacea, 15—20 ⇌ 7—9 μ, collo suberecto 3—4 μ cr. Setae myceliales paucae, laxe dispersae etiam juxta perithecia aggregatae, rectae, usque ad 750 ⇌ 9—11 μ, apice acutae vel raro breviter 2-dentatae.

Perithecia dispersa, atra, globosa, verrucosa, usque ad 180 μ diam. Sporae atrobrunneae, subellipsoideae, obtusae, 4-septatae, leniter constrictae, 46—53 ⇌ 20—25 μ.

Hab. in foliis *Coccolobae* spec. indet., Kartabo, British Guiana, Stevens 576 (typus); in foliis *Coccolobae sintensii,* Porto Rico, Stevens 7066.

This differs from the type mainly in the slightly more delicate mycelium and hyphopodia, but the mycelial cells are shorter and hence the colony appears denser. The type is in Herb. Farlow, while the second specimen quoted is in Herb. Paris.

(409) **Meliola randiae-aculeatae** Hansf., sp. n. (3111. 42x2).

Plagulae plerumque epiphyllae, usque ad 3 mm diam., tenues vel subdensae, raro confluentes. Mycelium ex hyphis atrobrunneis, subrectis, 7—8 μ cr., cellulis 25—35 μ longis, opposite acuteque ramosis, laxe vel subdense reticulatis compositum. Hyphopodia capitata alternata, antrorsa, recta, 25—35 μ long, cellula basali cuneata, 6—15 μ longa, cellula apicali ovata, apice subattenuata, integra, 18—24 ⇌ 9—13 μ. Hyphopodia mucronata pauca, in hyphis distinctis evoluta, alternata vel opposita, ampullacea, 15—20 ⇌ 7—8 μ, collo suberecto, brevi, 3—4 μ cr. Setae myceliales dispersae, etiam juxta perithecia aggregatae, rectae, simplices, obtusae vel subacutae, usque ad 450 ⇌ 8—9 μ. Perithecia matura non visa. Sporae atrobrunneae, cylindraceae, obtusae, 4-sept., constrictae, 38—44 ⇌ 17—19 μ.

Hab. in foliis *Randiae aculeatae,* S. Domingo, Ciferri 2781, in Herb. Stockholm sub *M. psychotriae* Earle.

(410) *Meliola rhois* P. Henn. in Englers Bot. Jahrb. **17**, 523. 1893. (3121. 5342).

The type collection, on *Rhus* sp., Brazil, Sellow, is represented in Herb. Stockholm, ex Herb. Sydow; it contains a mixture of two species of *Meliola,* of which one is *M. rhois* var. *flexuosiseta,* which would probably now be best classified as a variety of *M. rhoina* Doidge. The other species has the following characters:

Colonies epiphyllous, dense, velvety, crustose and easily secedent, up to 2 mm diam. Mycelium of undualate dark brown hyphae 7—9 μ thick, the cells 15—20 μ long, branching alternate or unilateral, not opposite, at acute angles, closely reticulate and almost solid. Capitate hyphopodia alternate, more or less antrorse-bent, mostly 25—37 μ long; stalk cell cylindric, often bent, 5—14 μ long; head cell very deeply and irregularly stellate-lobed, often bent to uncinate, 13—27 ⇌ 15—22 μ. Mucronate hyphopodia not seen. Mycelial setae very numerous, closely scattered and grouped around the perithecia, erect, simple, obtuse, flexuous to uncinate or even circinate in the upper half, up to 450 ⇌ 10—12 μ wide below, tapering to about 7 μ wide at obtuse apex. Perithecia in close central group, black, globose, ver-

rucose, to 320 μ diam. Spores dark brown, cylindric to subellipsoid, 4-septate, constricted, obtuse, 46—53 ⇌ 18—21 ⇌ 15—17 μ.

(411) *Meliola rhois* P. Henn. var. **africana** Hansf., var. n. (3111. 5332). ✓

Ab typo ita differt: — Hyphopodia capitata minora, 20—30 μ longa, cellula basali cuneata, 6—10 μ longa, cellula apicali irregulariter rotundato-lobata, 12—21 ⇌ 12—18 μ, recta vel varie curvata. Setae myceliales numerosae, rectae, simplices, acutae, 240—450 ⇌ 8—10 μ. Perithecia usque ad 240 μ diam. Sporae 39—50 ⇌ 17—21 μ.

In foliis *Rhois glaucescentis,* Entebbe Road, Uganda, Hansford 3360 (typus).

I have seen many collections of this variety from both Tropical and South Africa, and in general appearance the colonies are very distinct from those of the type of the species, especially in the much straighter mycelial setae. Apparently the type is limited to South America, and all African specimens I have seen belong to the present variety.

(412) *Meliola sandwicensis* Ell. & Ev., Bull. Torr. Bot. Club, **22**, 434. 1895. (3112. 4233).

On Rubiaceae indet., Hawaii, Heller 2369 in Herb. Stockholm, part of type collection: —

Colonies amphigenous, mostly hypophyllous, numerous, dense, velvety, 2—4 mm. diam. Mycelium of dark brown, substraight hyphae 6—7 μ thick, the cells mostly 10—20 μ long, branching opposite at wide angles, closely reticulate. Capitate hyphopodia opposite, straight or recurved, spreading, 12—15 μ long; stalk cell cylindric, 2—4 μ long; head cell subglobose to widely ovate, entire, 8—12 ⇌ 7—10 μ. Mucronate hyphopodia mixed with capitate, few, opposite or alternate, ampulliform, 12—18 ⇌ 5—7 μ, neck upturned, short 3 μ thick. Mycelial setae closely scattered and around the perithecia, straight simple, acute, 300—700 ⇌ 8—10 μ. Perithecia scattered, black, globose, verrucose, to 260 μ diam. Spores dark brown, cylindric to subellipsoid, obtuse, 4-sept., constricted, 38—46 ⇌ 17—19 ⇌ 12—14 μ.

(413) *Meliola sandwicensis* Ell. & Ev., var. **gouldiae** Hansf., var. n. ($31^1/_3 2$. 4233). ✓

A typo ita differt: Hyphis mycelii opposite acuteque ramosis, rectis, dense reticulatis, cellulis plerumque 15—30 μ longis. Hyphopodia capitata plus minusve antrorsa, 14—18 μ longa, cellula apicali integra, subglobosa vel late ovata, 9—13 ⇌ 7—10 μ. Setae myceliales dispersae, etiam juxta perithecia aggregatae, erectae, plerumque 200—250 μ longae, simplices et obtusae, clavatae vel breviter obtuse furcatae usque ad 20 μ, raro usque ad 700 μ longae tum simplices subacutae, totae 7—9 μ cr. Perithecia et sporae typo consimilia.

Hab. in foliis *Gouldiae coriaceae,* Hawaii, U.S.Dept. Agr. 71011, (typus, in Herb. Stockholm); in foliis *Gouldiae* spec. indet., Hawaii, Shear 642.

(414) **Meliola standleyi** Hansf., sp. nov. (3111. 3222).

Plagulae amphigenae, usque ad 8 mm. diam., vel numerosae confluentesque, subdensae, velutinae. Mycelium ex hyphis leniter undulatis, atrobrunneis, 6—7 μ crassis, cellulis plerumque 20—30 μ longis, opposite ramosis, dense reticulato-intertextis compositum. Hyphopodia capitata alternata, antrorsa vel patentia, recta vel curvula, 16—25 μ longa; cellula apicali ovata, apice saepe attenuato-rotundata, integra, 12—17 ⇌ 8—11 μ; cellula basali cuneata, 4—10 μ longa. Hyphopodia mucronata pauca, in hyphis distinctis evoluta, opposita vel alternata, ampullacea, 13—18 ⇌ 7—9 μ, collo brevi, suberecto, 4 μ cr. Setae myceliales numerosae, dispersae, erectae, rectae, simplices, obtusae, usque ad 500 ⇌ 7—9 μ, apice saepe curvulae vel torulosae. Perithecia dispersa, atra, globosa, verrucosa, usque ad 180 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 33—37 ⇌ 14—16 ⇌ 11—13 μ.

Hab. in foliis *Bignoniacearum* spec. indet., Tela, Honduras, Standley 55573 in Farlow Herb.

(415) **Meliola stevensiana** Hansf., sp. nov. (3133. 3221).

Plagulae epiphyllae, tenues, usque ad 3 mm. diam. vel interdum confluentes. Mycelium ex hyphis atrobrunneis, subrectis vel undulatis, 5—7 μ crassis, cellulis plerumque 20—40 μ longis, opposite lateque ramosis, laxe reticulato-interextis compositum. Hyphopodia capitata alternata vel usque ad 5% opposita, recta vel curvata, patentia, 10—15 μ longa; cellula basali cylindracea, 2—5 μ longa; cellula apicali subglobosa, late ovata vel curvata integra, apice rotundata, 8—12 ⇌ 8—11 μ. Hyphopodia mucronata illis capitatis commixta, alternata vel opposita, ampullacea, 17—25 ⇌ 6—8 μ, collo elongato, suberecto, 3 μ cr. Setae myceliales tenuiter dispersae etiam juxta perithecia aggregatae, erectae, subrectae, usque ad 250 ⇌ 7—8 μ, apice raro simplices et minute denticulatae, saepius 2—3-dentatae usque ad 15 μ, dentibus rugulosis. Perithecia dispersa, atra, globosa, verrucosa, usque ad 170 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 33—37 ⇌ 13—15 ⇌ 11—13 μ.

Hab. in foliis *Bignoniacearum* spec. indet., Terecita, Ecuador, Stevens 82, pro parte, typus in Farlow Herb.; Trinidad, Thaxter 7510; in foliis *Bignoniae unguis-cati,* Trinidad, Thaxter 7458, 7459.

In the type the colonies occur amongst those of *M. bignoniacearum* var. *parasitica,* from which they are easily distinguished by being larger and thinner and not causing a leafspot.

(416) *Meliola stizolobii* Hansf. & *Deight., var.* **brasiliensis** Hansf., var. n. (3143. 4221).

Plagulae epiphyllae, usque ad 3 mm. diam., densae. Mycelium ex hyphis atrobrunneis subrectis, 6—7 μ cr., cellulis plerumque 20—30 μ longis, opposite lateque ramosis, dense reticulatis compositum. Hyphopodia capitata opposita vel alternata, plerumque recta, 12—16 μ longa, cellula basali cylindracea, 2—5 μ longa, cellula apicali globosa vel ovata, integra, 10—13 ⇌ 7—12 μ. Hyphopodia mucronata illis capitatis commixta, opposita vel alternata, ampullacea, 16—19 ⇌ 7—9 μ, collo suberecto, 3 μ cr. Setae myceliales numerosae, dispersae etiam juxta perithecia aggregatae, rectae, usque ad 280 ⇌ 7—9 μ, apice 2—4-furcatae (— 25 μ), ramulis dentato-furcatis usque ad 10 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 150 μ diam. Sporae atrobrunneae, cylindraceae vel subellipsoideae, obtusae, 4-septatae, constrictae, 35—41 ⇌ 13—16 ⇌ 11—13 μ.

Hab. in foliis *Papilionacearum* spec. indet., Blumenau, Sta. Catharina, Brazil, U l e, Herb. Brasil. 1151, in Herb. Stockholm sub. *M. patouillardi.*

The colonies cause a faint brown spot on the upper surface of the leaf, indicating rather strong parasitism. The setae appear closely cristate, as the short branches are only slightly divergent.

(417) *M e l i o l a s t r y c h n i c o l a* Gaill., Le Genre *Meliola,* 1892, p. 72 (3111. 4221).

Type on *Strychnos* sp., Osika, Congo Francaise, D e B r a z z a, in Herb. Paris:

Colonies epiphyllous, thin, smooth, to 3 mm. diam. or widely confluent. Mycelium of undulate dark brown hyphae 6—7 μ thick, the cells mostly 20—25 μ long, branching opposite at acute angles, loosely to rather closely reticulate. Capitate hyphopodia alternate, antrorse, straight, 14—20 μ long, stalk cell cuneate, 3—7 μ long, head cell globose, entire, 9—14 ⇌ 9—12 μ. Mucronate hyphopodia mixed with the capitate, opposite or alternate, ampulliform, 15—20 ⇌ 7—8 μ. Mycelial setae only grouped around the perithecia ,straight to somewhat flexuous, simple, obtuse, up to 270 ⇌ 7 μ. Perithecia loosely scattered, black, globose, verrucose, to 140 μ diam. Spores dark brown, cylindric, obtuse, 4-septate, constricted, 35—41 ⇌ 11—13 μ.

(418) **Meliola tijucensis** Hansf., sp. n. (3111. 5323).

Plagulae amphigenae, plerumque hypophyllae, usque ad 10 mm. diam. vel confluentes, tenues, subvelutinae. Mycelium ex hyphis atrobrunneis, subrectis vel flexuosis, 7—10 μ cr., cellulis plerumque 25—40 μ longis, opposite vel irregulariter ramosis, reticulatis compositum. Hyphopodia capitata alternata, recta vel curvata, 20—33 μ longa, cellula basali cylindracea 6—12 μ longa, cellula apicali subglobosa integraque, rotundato-angulosa vel subglobata, 15—22 ⇌ 12—21 μ. Hyphopodia mucronata illis capitatis commixta, alternata vel opposita, ampullacea, 20—32 ⇌ 8—11 μ, collo suberecto 3 μ cr.

Setae myceliales numerosae, dispersae etiam juxta perithecia aggregatae, rectae, simplices, obtusae, usque ad 800 ⇌ 9—10 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 190 μ diam. Sporae atrobrunneae, cylindraceae vel ellipsoideae, obtusae, 4-septatae, constrictae, 44—50 ⇌ 17—20 ⇌ 14—16 μ.

Hab. in foliis *Allophylli* spec., Tijuca, Rio de Janeiro, Brazil, U l e, Herb. Brasil. 2514, in Herb. Farlow.

The colonies are at first loosely reticulate, but the mycelium becomes more branched and interwoven so that old colonies are dense in the centre.

(419) *M e l i o l a v i g n a e - g r a c i l i s* Hansf. & Deighton, var. **panamensis** Hansf., var. nov. (31¹/₃3. 4221).

Plagulae sparsae, epiphyllae, densae, usque ad 3 mm. diam. Mycelium ex hyphis atrobrunneis, subrectis vel undulatis, 7—8 μ cr., cellulis plerumque 15—30 μ longis, opposite lateque ramosis, dense reticulatis compositum. Hyphopodia capitata alternata, rarissime opposita, recta vel curvata, 15—21 μ longa; cellula basali cuneata vel cylindracea, 3—7 μ longa; cellula apicali globosa vel late ovata, integra, saepe curvata, 11—16 ⇌ 11—13 μ. Hyphopodia mucronata in hyphis distinctis evoluta, opposita vel alternata, ampullacea, 15—19 ⇌ 7—9 μ, collo erecto 3 μ cr. Setae myceliales tenuiter dispersae, erectae, subrectae, simplices et obtusae vel raro breviter 2-furcatae usque ad 20 μ, apice obtuse subdenticulatae, saepe torulosae et irregulariter curvulae, usque ad 280 ⇌ 8 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 170 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-septatae, constrictae, 36—42 ⇌ 13—14 μ.

Hab. in foliis *Meibomiae* spec., La Cruces Trail, Panama, S t e v e n s 152 (typus in Farlow Herb.); Panama, S t e v e n s 370, 85, 869; in foliis *Canavaliae lasiocalycis,* Panama, S t e v e n s 339; in foliis *Papilionacearum* spec. indet., Venezuela, C h a r d o n & S t e l l i n g 844.

In the type, as well as in some of the other specimens, there are numerous spores, ellipsoid, 32—38 ⇌ 14—16 μ, which probably do not belong to this *Meliola.* The collection on *Canavalia* has more numerous setae than the others. The colonies of this variety are peculiar in the distribution of the mucronate hyphopodia; these occur on separate hyphae with cells 25—40 ⇌ 7—9 μ, originating from near the centre of the colony and growing out over the rest of the mycelium to extend far beyond its limits as a loose fringe.

(420) **Meliola warneckei** Hansf., sp. n. (3111. 3222).

Plagulae plerumque epiphyllae, densae, subvelutinae, usque ad 2 mm. diam. vel confluentes. Mycelium ex hyphis atrobrunneis, 7—8 μ cr., cellulis 15—20 μ longis, subrectis, opposite lateque ramosis, reticulatis compositum. Hyphopodia capitata alternata, subantrorsa, recta

vel recurvata, 18—25 μ longa, cellula basali cuneata vel cylindracea, 5—8 μ longa, cellula apicali piriformi vel cylindracea, apice late rotundata, integra, recta vel curvata, 12—18 ⇌ 9—12 μ. Hyphopodia mucronata in centro plagularum in hyphis distinctis evoluta, opposita vel alternata, ampullacea vel conoidea, 14—19 ⇌ 7—8 μ, collo suberecto, brevi, 4 μ cr. Setae myceliales dispersae, etiam juxta perithecia aggregatae, numerosae, subrectae, simplices, acutae, usque ad 400 ⇌ 8—9 μ. Perithecia dispersa, atra, globosa, verrucosa, usque ad 170 μ diam. Sporae atrobrunneae, cylindraceae, obtusae, 4-sept., constrictae, 35—39 ⇌ 16—19,5 μ.

Hab. in foliis *Strychnodis* spec. indet., Togoland, R e h m. Ascomyceten 1620, leg. W a r n e c k e, in Herb. Stockholm sub *M. strychnicola* Gaill.

(421) **Schiffnerula salviae** Hansf., sp. n.

Plagulae epiphyllae, usque ad 2 mm. diam. vel confluentes, tenues, leves. Mycelium ex hyphis dilute brunneis, 6—8 μ cr. (cellulis 14—20 μ longis), tortuosis, irregulariter ramosis, laxe vel subdense reticulatis compositum. Hyphopodia alternata vel unilateralia, continua, hemispherica, integra, 6—8 μ diam. Perithecia lateralia et sessilia in hyphis mycelii, primo indistincte radiato-disciformia, demum globosa, usque ad 220 μ diam.; paries unistratosus, parenchymaticus, demum mucoso-diffluens. Asci 1—2, globosi, sessiles, 8-spori, usque ad 50 μ diam. Sporae conglobatae, oblongae, obtusae, 1-septatae, constrictae, leves, dilute brunneae, 20—24 ⇌ 12—13 μ, cellulis subaequalibus, subglobosis.

Hab. in foliis *Salviae constanzae,* San Domingo, C i f e r r i, Mycofl. doming. exs. 237, typus in Herb. Kew.

This was originally determined by C i f e r r i as *Meliola inermis;* I was unable to find any trace of a species of *Meliola* on this specimen.

(422) **Asterina markhamiae** Hansf., sp. n.

Plagulae epiphyllae, late effusae, tenues, leves. Mycelium ex hyphis atrobrunneis, subrectis, 4—5 μ cr., (cellulis plerumque 20—25 μ longis) opposite vel irregulariter ramosis, laxe reticulatis compositum. Hyphopodia alternata vel opposita, continua, conoideo-digitata, leniter sinuoso-irregularia, apice rotundata, recta vel curvula, raro sublobata, 6—9 ⇌ 4—5 μ. Thyriothecia laxe dispersa, atra, convexa, levia, orbiculata, usque ad 160 μ diam., raro 2—3-connata; paries inferior tenuissimus, griseo-hyalinus, radiatus, hyphis 4—5 μ cr.; paries superior atrobrunneus, radiatus, hyphis 3,5—4,5 μ cr., margine crenatus vel laxe subgimbriatus, hyphis fimbriarum usque ad 70 μ longis, stellatim dehiscens, demum late apertus. Asci circa 8, globosi, aparaphysati, 8-spori, immaturi. Sporae conglobatae, oblongae, obtusae, 1-septatae, constrictae, atrobrunneae, 21—25 ⇌ 11—12 μ, cellulis subaequalibus,

episporio tenuiter denseque verruculoso-echinulato. Conidia non visa.

Hab. in foliis *Markhamiae platycalycis*, Pengeni, Tanganyika, Grote in Sydow, Fung. exot. exs. 248, typus in Herb. Kew.

(423) **Asterina malleae** Hansf., sp. n.

Plagulae epiphyllae, suborbiculares, circa 2 mm. diam., numerosae, tenues, griseo-atrae, leves. Mycelium laxe reticulatum, ex hyphis subrectis vel leniter undulatis atrobrunneis, 5—6 μ cr., cellulis plerumque circa 30 μ longis, opposite ramosis compositum. Hyphopodia continua, opposita vel unilateralia, subinde alternata, patentia, varie 2—3-lobata, 6—10 ⇌ 5—11 μ. Thyriothecia subaggregata vel saepe 2—3-connata, singulis rotundatis, 100—150 μ diam.; paries inferior tenuissimus, radiatus, griseo-hyalinus, hyphis 3 μ cr.; paries superior convexus, ater, opacus, radiatus, hyphis 4—5 μ cr., cellulis usque ad 11 μ longis; stellatim dehiscens, demum late apertus, margine fimbriatus, hyphis fimbriarum tortuosis, usque ad 100 μ longis, illis mycelii pallidioribus, exhyphopodiatis, 3,5—5 μ cr. Asci 4—8, globosi vel late ellipsoidei, 8-spori, aparaphysati. Sporae conglobatae, atrobrunneae, oblongae utrinque rotundatae, constrictae, 1-septatae, 24—28 ⇌ 12—14 μ cellulis subaequalibus, episporio subtiliter denseque echinulato. Conidia non visa.

Hab. in foliis *Malleae rothii*, Ceylon, typus in Herb. Stockholm, ex Berkeley.

No collector's details are given on the specimen.

(424) **Asterolibertia crustacea** (Ell. & Ev.) Hansf., comb. n.

Syn.: *Asterella crustacea* Ell. & Ev., Publ. Field. Mus. Columbia, Bot., **2**, 15. 1900. — *Asterina crustacea* (Ell. & Ev.) Sacc. & Trott., Syll. Fung., **22**, 539. 1913.

Specimen: On *Psidium guajava*, S. Domingo, Ciferri 2896 and 2915, in Herb. Stockholm: —

Colonies epiphyllous on dark reddish-brown leafspots, up to 8 mm. diam. or confluent; mycelium superficial, of dark brown, crooked hyphae 4,5—5,5 μ thick, the cells 10—20 μ long, branching opposite or irregular, loosely reticulate, often in strands of 2—3 parallel hyphae. Hyphopodia not differentiated from normal mycelial cells, most of which have 1—2 minute pores in their lower surface, less than 1 μ diam., from which fine hyaline filaments penetrate into the epidermal cells, each forming a minute, flattened-discoid haustorium within, but closely adherent to the outer wall of the host cell, scarcely visible even when stained. There is no other penetration of the host, and the discoloration of the leaf-spots is due to the death of neighbouring epidermal cells, which are stained brown. Thyriothecia closely scattered, sometimes confluent at the edges, black, flattened, roughly circular in outline, up to 400 μ diam.; upper wall of dark brown, wavy-radiating hyphae 3,5—4,5 μ wide, the margin

more or less fimbriate, the fringing hyphae often adherent in sheets, wavy-tortuous radiating, up to 60 μ long; lower wall very thin, hyaline, composed of a single layer of flattened, gelatinous hyphae, dehiscent by a few stellate fissures. The thyriothecia are about 30—40 μ high in the centre, which at first is marked by an erect column of hyaline hyphae about 50—60 μ diam. and 30—40 μ high; this disappears as the asci mature. Asci fairly numerous, horizontal, centripetal, maturing in succession, at first clavate with rather elongate narrowed stalk, up to 100 ⇌ 20—25 μ, the stalk portion being about 40 ⇌ 5—7 μ, later becoming cylindric-saccate and then up to 30 μ wide; wall 1—1,5 μ thick, in immature asci thickened up to 7 μ around apex, which also has a rather wide and shallow "interior canal". Spores 8, irregularly and obliquely 2—3-seriate, hyaline, becoming pale brown, clavate, 1-septate, deeply constricted, smooth, 25—28 μ long; upper cell globose to wide ovate, 14—16 ⇌ 13—14 μ; lower cell obtusely conoid, 12—14 ⇌ 8—9 μ. Paraphyses none.

This may not exactly equal *A. crustaceae* Ell. & Ev., of which I have seen only the description, in which no mention is made of the prominent dark red-brown leafspots occurring in the present specimens, though mention is made of the absence of hyphopodia and setae.

(425) **Asterolibertia peruviana** Hansf., sp. n.

Plagulae epiphyllae, tenues, aegre perspicues, usque ad 2 mm. diam., vel effusae confluentesque. Mycelium ex hyphis dilute brunneis, 4—6 μ cr., rectis vel leniter flexuosis, cellulis plerumque circa 15 μ longis, opposite vel irregulariter acuteque ramosis, laxe reticulatis compositum. Hyphopodia ab cellulis mycelii non distinguenda, intercalata, numerosa. Thyriothecia dispersa, rotundata, brunnea, convexa, radiata, usque ad 200 μ diam.; paries superior ex hyphis brunneis 4—5 μ cr., cellulis usque ad 12 μ longis, margine haud fimbriatus, poro centrali pertusus; paries inferior hyalinus, indistinctus. Asci non visi. Sporae brunnescentes, oblongae, obtusae, 1-septatae, leniter constrictae, leves, 17 ⇌ 8 μ, cellulis subaequalibus.

Hab. in *Bignoniacearum* spec. indet., Seringal Auristella, Rio Acre, Peru, Ule, Herb. Brasil. 3452, in Herb. Stockholm, ex Herb. Sydow.

The colonies are mixed with those of *Irene peruviana* in this specimen. The hyphopodia are not distinguished from the mycelial cells, most of which have a minute pore in their lower surface, marking the attachment of a haustorium in the leaf epidermis.

(426) **Lembosia stevensii** Hansf., sp. nov.

Plagulae epiphyllae, densae, usque ad 5 mm. diam., leves. Mycelium ex hyphis atrobrunneis, subrectis, 5—6 μ crassis, cellulis plerumque 20—30 μ longis, irregulariter ramosis, laxe reticulatis compositum.

Hyphopodia in hyphis primariis laxe dispersa, alternata, hemisphaerica vel irregularia, continua, concolorata, 7—11 μ diam. Thyriothecia in centro plagularum aggregata, saepius connata, orbiculata vel elongata, 300—600 ⇌ 280—350 μ, opace nigra, depresso-convexa, longitudinaliter aperta; paries superior ex hyphis atrobrunneis, 4—6 μ crassis, radianto-parallelis compositus margine haud fimbriatus, irregulatiter crenatus; paries inferior subhyalinus vel dilute brunneus, haud radiatus. Asci aparaphysati, subsessiles, ovati vel globosi, 8-spori, apice incrassati usque ad 8 μ, usque ad 70 ⇌ 50 μ. Sporae conglobatae, atrobrunneae, oblongae utrinque rotundatae, 1-septatae, fortiter constrictae, 28—32 ⇌ 16—18 μ, episporio atro-granuloso, cellulis subglobosis, inferiore 15—16 μ diam.

Hab. in foliis *Byrsonimae* spec. indet., British Guiana, Stevens 333 (a) in Farlow Herb.

The young asci develop within a hyaline, loose tissue of septate, mucose hyphae, and at maturity are separated by its remains and by collapsed asci; there are no true paraphyses. The young asci are thickened around the apex to 8 μ, with a shallow, wide, interior "canal", but as they ripen the canal and the thickening are reduced and the mature apex is only 1.5 μ thick; though 8 spores are formed only 2—4 may mature.

(427) *Patouillardina clavispora* (Pat.) Arnaud, Thesis, Montpellier, p. 181, 1918.

The type collection, Balansa in Roum., Fung. sel. exs. 5631, on leaves of ?*Eugenia* sp., Tonkin, is represented in Herb. Kew and has been re-examined: —

Colonies epiphyllous, black, orbicular, dense, smooth, up to 3 mm. diam. Mycelium closely reticulate, of substraight dark brown hyphae 5—7 μ thick, the cells mostly 10—20 μ long, often irregularly torulose, branching usually opposite at acute to wide angles. Hyphopodia alternate or unilateral, usually one to each cell, continuous, subglobose to short cylindric with broadly rounded apex, sometimes slightly angulose or bent, 8—11 ⇌ 6—7 μ. Thyriothecia scattered, round, convex, black, smooth; lower wall indistinct; upper wall of radiating dark brown hyphae 5—7 μ thick, the cells 5—10 μ long, not fimbriate at the margin, stellate dehiscent into narrow triangular segments almost to the margin. Asci not seen. Spores subopaque dark brown, clavate, both ends obtuse, 2-septate, constricted, 38—46 ⇌ 14—16 μ.

This is mixed in the type collection with the following variety: —

P. clavispora var. **tenuis** Hansf., var. n.

Plagulae tenues, effusae, confluentes, leves. Mycelium ex hyphis atrobrunneis, 4—6 μ cr., cellulis plerumque 20—30 μ longis, subrectis, subremote opposite lateque ramosis, laxe reticulatis compositum. Hyphopodia illis typi consimilia. Thyriothecia ut typo. Sporae atro-

brunneae, clavatae, obtusae, 2-septatae, subconstrictae, leves, 35—43 ⇌ 12—15 μ.

Hab. in foliis ?*Eugeniae* spec., Tonkin, Balansa in Roum., Fung. sel. exs. 5631 p. p., typus in Herb. Kew.

The colonies of this variety are easily distinguished from those of the type, being much thinner, more sprading, and having the hyphopodia more thinly scattered along the hyphae. This difference is seen even in the germination of the spores, which are otherwise indistinguishable from those of the type. The colonies often penetrate those of the type on the same leaf.

(428) **Peltaster byrsonimae** Hansf., sp. nov.

Plagulae hypophyllae, tenues, atrae, leves, usque ad 4 mm. diam. Mycelium ex hyphis subrectis, brunneis, 2—3 μ crassis, exhyphopodiatis, irregulariter ramosis, laxe reticulatis compositum. Pycnothecia dispersa, in hyphis mycelii evoluta, orbiculata, atra, convexa, usque ad 180 μ diam.; paries superior radiatus, margine haud vel lenissime fimbriatus, ex hyphis brunneis, radiantibus, 2—3 μ cr., compositus; paries inferior hyalinus, mucosus, haud radiatus. Pycnosporae fusoideo-ellipticae, rectae, continuae, hyalinae, leves, utrinque attenuato-rotundatae, 14—17 ⇌ 3—3,5 μ.

Hab. in foliis *Byrsonimae* spec. indet., British Guiana, Stevens 333 (b) in Farlow Herb.

The superficial mycelium sends short branches into the stomata of the host leaf, which penetrate between the guard cells and on the interior surface of these and the adjoining cells of the epidermis spread out to form a plate of small hyaline cells only 2—3 μ thick, very closely adherent to the host cells. No haustoria are formed in the host cells and there is no further penetration of the leaf tissue. The pycnothecia dehisce by a few short stellate fissures from a central irregular small pore in the upper wall, the central portions of which soon disintegrate to leave a wide opening. The pycnospores are formed directly upon the mucose, irregular hyphae of the lower wall of the pycnothecium.

(429) **Trichasterina cheirodendronis** Hansf., sp. n.

Plagulae amphigenae, atrae, subcrustosae, leves, densae. Mycelium ex hyphis brunneis, sinuosis, 5—6 μ cr., cellulis plerumque 10—20 μ longis, irregulariter acuteque ramosis, saepe 2—4-parallelis compositum, radianto-reticulatum, subsolidum. Hyphopodia alternata vel dispersa, fortiter antrorsa, recta vel curvata, continua, ovata, apice rotundata, atro-brunnea, 10—15 ⇌ 7—10 μ. Setae myceliales paucae, dispersae, erectae, simplices, rectae, obtusae, atrae, usque ad 50 ⇌5 μ. Thyriothecia in centro plagularum aggregata, orbiculata, convexa, atra; paries superior radiatus, ex hyphis subopace atrobrunneis, 5—8 μ cr. compositus, poro centrali irregulari dehiscens, demum

radiatim apertus; paries inferior fibrosus, indistincte radiatus, subhyalinus vel pallide brunneus. Asci non visi. Sporae brunneae, oblongo-clavulatae utrinque attenuato-rotundatae, 1-septatae, constrictae, 32—38 μ longae, cellula superiore 22—24 ⇌ 11—13 μ, inferiore 10—16 ⇌ 8—10 μ, pallidiore.

Hab. in foliis *Cheirodendronis gaudichaudii,* Hawaii, Stevens, Fungi of Hawaii 641, typus in Herb. Kew.

The spores germinate from the lower, paler and smaller cell, by formation of a short germ-tube terminated by a hyphopodium, behind which the tube develops mycelial hyphae.

(430) **Trichasterina polyalthiae** Hansf., sp. n.

Plagulae amphigenae, tenues, usque ad 1 mm. diam. Mycelium ex hyphis radiantibus, subrectis, atrobrunneis, 5—7 μ cr. (cellulis plerumque 15—40 μ longis) irregulariter acuteque ramosis, saepe fasciculatis compositum. Hyphopodia cellulis mycelii consimilia, intercalata, irregulariter disposita, haud tumida. Setae ex hyphis mycelii et margine thyriothecii oriundae, erectae, simplices, rectae vel sursum subtorulosae, obtusae, 3—4-septatae, usque ad 150 ⇌6—8 μ. Conidia ovato- piriformia, deorsum attenuata, basi truncata, apice late rotundata, atrobrunnea, continua, 15—20 ⇌ 10—12 μ, episporio levi vel tenuiter atro-granuloso; poris germinationis supra medium, 3—4, obsoletis praedita. Thyriothecia in centro plagularum dense aggregata, distincta vel subconnata, orbiculata, atra, usque ad 300 μ diam., margine haud fimbriata; pries superior radiatus, ex hyphis atrobrunneis 4 μ cr. compositus, stellatim dehiscens; paries inferior subhyalinus vel dilute brunneus, radiatus, hyphis 4—5 μ cr. Asci numerosi, in ordine maturascentes, sessiles, ovati vel subglobosi, 8-spori, 35—40 μ diam., tenuiter tunicati, aparaphysati. Sporae atrobrunneae, oblongae utrinque rotundatae, 1-septatae, constrictae, 20—24 ⇌ 10—12 μ; cellula superiore globosa, leniter majore; episporio levi vel obsolete granuloso.

Hab. in foliis *Polyalthiae* spec., Pulau Penang, Malaya, Burkill 4130, p. p., typus in Herb. Kew.

The hyphopodia are not differentiated from other cells of the mycelium, save by the presence of a minute pore on the lower surface next the leaf, marking the attachment of the epidermal huastorium. The setae described may possibly function as conidiophores; some appeared to have conidial scars near the apex, though no attached conidia were found; no other conidial apparatus was discovered in this material. Germination of both conidia and ascospores is by the formation of a globose, sessile hyphopodium, from which the mycelium later grows out. The asci are separated by collapsed cells, which I regard rather as aborted or discharged asci than as paraphyses.

(431) **Balladynella byrsonimae** Hansf., sp. n.

Plagulae hypophyllae, aegre perspicues, effusae. Mycelium ex hyphis olivaceis, ramosis, 3—4 μ cr., cellulis 20—40 μ longis, inter tomentum folii penetrantibus, compositum. Setae myceliales nullae. Hyphopodia nulla. Perithecia laxe dispersa, globosa demum piriformia, atra, usque ad 75 μ diam. et 90 μ alt., deorsum hyphis mycelii, sursum setis paucis ornata; setae patentes, rectae vel flexuosae, olivaceae, septatae, obtusae, subinde depressae et in hyphis mycelii transeuntes. Paries perithecii unistratosus, pellucide olivaceus, extus levis, circa 8 μ cr., ex cellulis 8—15 μ diam. compositus, demum apice late apertus. Asci 3—4, in ordine maturascentes, ovato-ellipsoidei, sessili, aparaphysati, 8-spori, usque ad 40 ⇌ 20 μ, in juventute apice incrassati usque ad 4 μ. Sporae 2—3-seriatae, oblongae utrinque rotundatae, 1-septatae, leniter constrictae, leves, dilute olivaceae, 18—22 ⇌ 6—7 μ, cellulis aequalibus vel superiore leniter breviore crassioreque.

Hab. in foliis *Byrsonimae* sp., San Domingo, C i f e r r i, Mycofl. doming. exs. 46-ter., typus in Herb. Kew.

The external mycelium ramifies irregularly between the leaf-hairs, and sends short side branches into the stomata. The perithecia are at first globose, but later extend upwards at the apex into a slightly projecting "ostiole", which later is forced open by the mucus formed within, and the elongate cells of the apex of the perithecial wall then surround this firm hyaline mucus as "periphyses" at its base. No conidial stage was found. Young perithecia are filled with an indistinctly fibrous hyaline thin-walled tissue.

(432) **Englerula semecarpi** Hansf., sp. n.

Plagulae hypophyllae, effusae, tenues, leves. Mycelium ex hyphis brunneis, flexuosis, 2—3 μ cr., obsolete septatis, irregulariter ramosis, laxe reticulatis compositum. Perithecia superficialia, dense aggregata, primo atra, globosa, parenchymatica, sessilia, levia, 100—120 μ diam.; paries unistratosus anguloso-parenchymaticus, demum mucoso-diffluens. Asci circa 12, aparaphysati, late ellipsoidei, sessiles vel nodoso-stipitati, apice late rotundati, crasse tunicati (—5 μ), 8-spori, 30—35 ⇌ 15—18 μ. Sporae 2—3-seriatae vel conglobatae, oblongae utrinque rotundatae, dilute brunneae, 1-septatae, constrictae, leves, 15 ⇌ 7 μ, cellulis aequalibus. Conidia nulla.

Hab. in foliis *Semecarpi heterophylli,* Depok, Java, B o e d i j n 2087 (Bogor Herb. 13619).

Some penetration of the host stomata by the mycelium was observed, but the material was in too poor condition to find haustoria in the mesophyll; no internal mycelium was found in it.

(433) **Meliolinella uncinata** (Syd.) Hansf., comb. n.

Syn.: *Balladyna uncinata* Syd., Ann. Myc. **12**: 546. 1914.

Colonies amphigenous, black, 1—2 mm. long by 1 mm. wide, subdense, setose. Mycelium of brown exhyphopodiate crooked hyphae,

4—7 μ wide, cells mostly 7—15 μ long, slightly constricted at many septa, closely and irregularly branched, intricately reticulate and in the centre almost solid. Mycelial setae numerous, erect-spreading, pale brown, simple, obtuse, subhyaline at apex, up, to 250 ⇌ 6—7 μ, multiseptate, thick-walled, smooth, substraight to broadly uncinate or twisted to coiled in the lower half. Conidia none. Perithecia scattered, sessile or very short-stipitate, subglobose to ovate, up to 65 μ diam., at first dark olivaceous-brown, becoming paler at maturity, not setose. Wall of one layer of angular parenchyma about 8 μ diam. and thick, dark-granulose on the surface, at maturity tending to separate. Asci 1—2, ovate-globose, sessile, aparaphysate, 8-spored, up to 45 ⇌ 35 μ. Spores conglobate, oblong with rounded ends, becoming clear brown, 1-septate and slightly constricted in middle, smooth, 22—26 ⇌ 9—11 μ, germinating by production of mycelial hyphae from each end.

On *Schizostachyum* sp., Rizal, Luzon, Philippines, Sydow, Fung. exot. exs. 366; on indet. Bamboo, Philippines, PBS 25016 p. p.

Preserved material was too difficult to section.

(434) **Piline hamatum** (Penz. & Sacc.) Hansf., comb. n.

Syn.: *Dimerosporium hamatum* Penz. & Sacc. Malpighia **11**: 389. 1897.

Part of the type collection on *Quercus* sp., Tjibodas, Java, Penzig 468, is in the Bogor Herbarium, and has been examined: —

Colonies hypophyllous, black, dense, to 15 mm. diam. or more, velvety. External mycelium of disconnected chains or small groups of subglobose dark brown cells, connected to a subcuticular mycelium of small hyaline cells, aggregated to form almost a continuous plate towards the centre of the colony, and in places up to 5 cells deep. The internal mycelium extends from below the cuticle into and between the epidermal cells, and the walls of these are sometimes stained black; beneath the epidermis a layer of 1—2 cells thick of hyaline mycelium is formed, rarely penetrating deeper into the mesophyll. There is no obvious relationship with the stomata, and no haustoria in the host cells. The cells of the external mycelium around the edges of the colony are more or less globose, subopaque dark brown, smooth or finely verruculose, up to 10 μ diam. The perithecia originate as hemispheric swellings and aggregations of the external mycelium, which grow upwards to expand into a spherical black head, at first consisting of several layers of large, opaque dark brown parenchyma, enclosing a nucleus of hyaline, thin-walled, loose tissue of hyphae 3—4 μ wide, septate, branched. The asci arise in a basal group and eventually occupy the whole of the central loculus, by lysigenous degeneration of the original ground tissue, which disappears almost completely. Finally the mature ascoma opens by

irregular fracture at the apex. Mature asci up to about 20, erect, thick-walled (to 5 μ around the apex), cylindric-ellipsoid, contracted below into a short wide stipe, or subsessile, 8-spored, up to 100 ⇌ 30 μ. Spores irregularly 2-seriate, becoming brown, oblong with rounded ends, 1-septate, constricted, the cells subequal, smooth, 25 ⇌ 12 μ.

The ascomata are almost completely hidden by large numbers of erect setae developing around their bases, not from the sides and apex as given by P e n z i g, erect, simple, circinate to hamate above, obtuse, opaque black, septate, up to 700 ⇌ 7—10 μ. The ascomata are slightly verrucose, black, globose, at first on a stromatic base, which becomes of loose texture with the development of the setae, so that mature ascomata are quite loosely attached to the host; up to 200 μ diam., with a wall of 1—2 layers of opaque black cells about 10—15 μ thick, all internal tissues having been replaced by the asci. Paraphyses none.

(435) *S t o m a t o g e n e a g a v e s* (Ell. & Ev.) Theiss., Ann. Myc. **14**: 404. 1916.

Specimen: R e h m, Ascomyceten 2102, on *Agave atrovirens*, Mexico, in Herb. Farlow:

Ascostromata formed in the mouth of the host stomata, and filling the outer stomatal cavity, its ring-like expansion above the guard cells, and neighbouring epidermal cells, with a black stromatic mass of cells. This stroma is connected through the stomatal pore with an extensive intercellular, hyaline, branched mycelium in the mesophyll, which does not form haustoria in the host cells. There is no other means of parasitism, nor penetration of the epidermis direct through the cuticle. The external mycelium consists of dark brown hyphae, crooked, irregularly and closely branched, extending outwards from the host stomata and from the ascomata, closely adherent to the cuticle and often forming mycelial knots in its furrows, the cells mostly 15—20 ⇌ 4—5 μ; there are no hyphopodia. Perithecial development of the stromatic type; the ascostroma reaches the surface of the leaf and spreads out to form a more or less globose head up to 180 μ diam. and 120 μ high above the leaf surface, hard and rather brittle in texture, consisting of several layers of thick-walled, black cells 8—10 μ diam., enclosing one or two patches of thin-walled hyaline parenchyma, which represent the young locules. The asci develop from the base of these locules and replace the original hyaline ground tissue during their enlargement, the mature loculus containing only the aparaphysate asci, with delicate short-septate filaments lining the wall. The stromata may contain one or more loculi, and in the latter case the partition between them may disappear at full maturity; finally the stroma opens by irregular fracture of the apex. Asci broadly clavate-ellipsoid, often bent,

shortly nodose-stipitate, rounded and thickened to 5—6 μ at the apex, up to 60 ⇌ 20—25 μ, 4—8-spored, aparaphysate. Spores multiseriate and more or less parallel in the ascus, clavulate-oblong with rounded ends, becoming brown, 1-septate above the middle, the upper cell subglobose, about 8 μ diam., the lower cell slightly attenuate to the rounded base, about 12 ⇌ 7 μ, the whole spore 18—21 μ long; epispore closely and finely verrucose-echinulate. Conidia none.

(436) **Diploidium anacardii** Hansf., sp. n.

Plagulae hypophyllae, primo tenues et fulvae, brunnescentes, demum densae. Mycelium ex hyphis rectis, pellucide rufo-brunneis, 5—6 μ cr., cellulis plerumque 30—40 μ longis, irregulariter ramosis, dense radiantibus compositum. Stomopodia lateralia, plerumque sessilia, subglobosa, 8—15 ⇌ 8—10 μ. Conidiophora dense stipata, erecta, usque ad 60 μ alt., continua vel 1-septata, levia, rufo-brunnea, simplicia. Conidia singula, acrogenea, rufo- vel atro-brunnea, ellipsoidea, levia, 1-septata, haud constricta, apice late rotundata, basi primo truncata demum subrotundata, 30—36 ⇌ 17—18 μ, cellulis subaequalibus.

Hab. in foliis *Anacardii occidentalis*, San Domingo, C i f e r r i, Mycofl. doming. exs. 248 p. p., typus in Herb. Kew.

The mycelium contains a bright red dye, soluble in most mounting media, turning green with strong acids. The conidia when first detached have a flat basal hilum about 8 μ diam., but later become rounded at the base, still surrounded by a slight ring, representing the attachment to the wall of the conidiophore. The specimen contains very young stromata, probably of *Parodiopsis* sp., but none were found sufficiently developed to contain asci and spores.

(437) **Triposporium ledermannii** Hansf., sp. n.

Mycelium ex hyphis hyalinis in plagulis *Balladynopsidis ledermannii*, 2—4 μ cr., obsolete septatis, reticulatis compositum. Conidiophora singula, ex cellulis mycelii leniter tumidis, dilute olivaceis oriunda, erecta, recta, continua, sursum attenuata, usque ad 20 μ alt., basi 5 μ cr., simplicia, dilute olivacea. Conidia terminalia, singula, stauriformia, ex cellula basali olivacea turbinata 5—10 ⇌ 3 μ (sursum 8 μ cr.), et sursum radiis 3—4, divergentibus, leniter ascendentibus, rectis composita; radii 1-septati, cellula basali subglobosa, olivacea, 6—8 μ diam., cellula distali elongata, versus apicem obtusam attenuata, subhyalina, usque ad 15 μ longa, apice 2 μ cr.

Hab. Fungus in plagulis *Balladynopsidis ledermannii* parasiticus, in foliis *Bignoniacearum* spec. indet., Sepik, New Guinea, L e d e r m a n n, typus in Herb. Farlow.

NOTES ON SOME INDIAN USTILAGINAE VIII.*

By M. S. Pavgi (College of Agriculture, Benaras Hindu University) et M. J. Thirumalachar (Malleswaram, Bangalore, India).

With plates I and II.

This is a continuation of the previous studies by the authors on the ustilagineae collected from several places in India. The types of the new species reported in this paper have been deposited in the Herb. Crypt. Ind. Orient., New Delhi, Herb. C. M. I., Kew England and in the Mycological Division, Plant Industry Station, Beltsville, Maryland, U.S.A.

1. **Tilletia themedae-anatherae** sp. nov.

Sori in the ovaries, affecting only a few spikelets in the inflorescence, 1—1.5 cms. long, 1.5 to 2 mm broad, protruding beyond the glumes, covered by a false membrane enclosing black spore mass. Mature spores subglobose to spherical, brownish-black to opaque, 18.6—24.3 μ in diameter with a mean of 21.8 μ. Epispore thick, pale-brown, covered by truncate scale-like processes. Sterile cells numerous, thick-walled, hyaline, 12.9 to 17.2 μ in diameter.

Hab. in ovaries of *Themeda anathera* Hack., Mussorie, Uttar Pradesh, 24-10-1953, leg. M. S. Pavgi. (Figs. 1 to 4).

Sori nonnulla tantum ovaria inflorescentiae inficientes, 1—1.5 cm longi, 1.5—2 mm lati, e glumis prominuli, membrana falsa obtecti, sporarum massa nigra repleti; sporae maturae subglobosae vel sphericae brunneo-atrae vel opacae, 18.6—24.3 μ plerumque 21.8 μ diam. metientes. Episporium crassum, pallide brunneum, verruculis truncatis ornatum. Cellulae steriles numerosae, crassis parietibus praeditae, hyalinae, 12.9—17.2 μ in diam.

The fungus somewhat resembles in the spore character *Tilletia themedicola* Mishra & Thirumalachar (Sydowia **7**: 82, 1953) on *Themeda quadrivalvis* Kuntz. recorded from Parasnath, Bihar. The spores of this latter fungus are larger in size 22.5—30.5 μ and the scale-like processes covering the episspore are of different shape than in the species under study. In *T. themedae-anatherae* sori superficially resembles that of a *Sphacelotheca* in having a long slender structure covered by a false membrane.

2. **Tilletia panici-humilis** sp. nov.

Sori in the ovaries, infection scattered in the inflorescence, inconspicuous, concealed by the enveloping glumes, becoming evident on

*) Part VII in Sydowia VII: 98—102, 1953.

rupture of the sorus revealing black spore mass. Mature spores subglobose to spherical, olive-brown, to opaque, 15.8—21.5 μ in diameter with a mean of 18.9 μ. Epispore thick, with 5 to 6 angled reticulations. Sterile cells numerous, hyaline, subglobose to angular, thick-walled, 13—17 μ in diameter.

Hab. in ovaries of *Panicum humile* Nees, Banaras, Uttar Pradesh, 24-9-1953, leg. M. S. Pavgi. (Figs. 5 to 7).

Sori in ovariis per totam inflorescentiam dispersi, inconspicui, glumis obtecti, tandem sporis ejectis manifeste visibiles. Sporae maturae subglobosae vel sphaericae, olivaceo-brunneae vel opacae, 15.8—21.5 μ, plerumque 18.9 μ diam.; episporio crasso, reticulato, areolis 5—6-angulosis; sporae steriles numerosae, hyalinae, subglobosae vel angulares, crassis parietibus praeditae, 13—17 μ in diam.

Tilletia panici-humilis is closely related to *T. courtetiana* Har. & Pat. (Bull. Mus. Hist. Nat. (Paris) 2: 197, 1909) which parasitises *Panicum proliferum* Lam. in Belgian Congo and French Congo in Africa. The spores of this are also olive-brown, with epispore which is reticulate having 5—6 angled alveoli. Examination of the type material indicated that the spores are 18.4 to 24 μ in diameter with a mean of 21.5 μ where as in *T. panici-humilis* the spores are smaller in size, 15.8—21.5 μ with a mean of 18.9 μ. Two other species of *Tilletia* on species of *Panicum* with reticulate epispore are *T. tumefaciens* H. & P. Syd. on *P. antidotale* and *T. narasimhanii Thirumalachar* & Safee, on *Panicum trypheron,* both occurring in India. *T. tumefaciens* incites a large hood-shaped gall on the leaves and culms with spores 17—24 μ with a mean of 20.5 μ. *T. narasimhanii* is a different species with pale cinnamon-brown coloured spores which are 20—27 μ in diameter with a mean of 23 μ.

(3) Chamydospore germination in *Tilletia eleusines* Syd.

The ovaricolous smut on *Dactyloctenium aegypticum* Richt. (*Eleusine aegyptica* Desf.) first described by Sydow (Ann. Mycol. **32**: 287, 1934) occurs in several parts of India. The chlamydospores are dark-brown with reticulate epispore. The chlamydospores were germinated on slides at room temperature (22—24 C.) by the method outlined by the writers (Indian Phytopathology **3**: 177—178, 1950). Freshly collected spores germinated after an incubation period of 4 days by the development of a stout promycelium. The single large fusion nucleus from the spore migrated into the promycelium. By further development, a terminal whorl of 6 to 8 sporidia were formed which conjugated immediately. The conjugating tubes are formed laterally and the sporidia at this stage appear as forked structures (Figs. 16 to 18). The type of germination and formation of conjugating branches are exactly similar to that of *T. tumefaciens* Syd. (Thiruma-

lachar Lloydia **13**: 165—167, 1950) and of *T. narayanaraoana* (Thirumalachar & Mundkur Mycol. Pap. 40, C. M. I., England, p. 6—7, 1951). Soon after conjugation, the entire crown of sporidia detatched from the promycelium. Infection hyphae are formed directly, and no secondary sporidial formation has been observed.

(4) *Ustilago ornata* Tracy & Earle. Bull. Torrey Bot. Club. **22**: 175, 1905.

Sori ovaricolous, only few spikelets in the panicle infected, minute inconspicuous. Infected ovary slightly enlarged in early stages, appearing as greyish-green ovate bodies, 0.25—0.5 mm long, 0.2 to 0.3 mm broad, rupturing at maturity and exposing the dark powdery mass of spores. Mature spores reddish-brown, subglobose to spherical, 11.5 to 16.5 μ in diameter with a mean of 13.8 μ. Epispore thick and covered with sharp echinulations.

Hab. in ovaries of *Leptochloa filiformis* (Lam.) Beauv., Allahabad, Uttarpradesh, 10-10-1952, leg. M. S. Pavgi. (Figs. 9 to 11).

The fungus is identical with *U. ornata* on *Leptochloa uninervia* and *L. filiformis* reported from the United States, with echinulate spores measuring 10—17 μ in diameter.

(5) *Entyloma nymphaeae* (Cunningh.) Setchell var. **macrospora** Thirumal. Pavgi & Safee. var. nov.

Ressembling *Entyloma nymphaeae* in the type of symptoms produced and colour and shape of the spores, but spores are larger in size 12.5—19 ⇌ 8—14 μ as compared with 8—14 ⇌ 8—11 μ in *E. nymphaeae.*

Hab. on leaves of *Nymphaea* sp. Banaras, Uttar Pradesh, 10-9-1952, leg. M. S. Pavgi (Figs. 12 to 15).

Entyloma nymphaeae similis, sporae 12.5—19 ⇌ 8—14 μ.

(6) *Schroeteria delastrina* (Tul.) Winter in Rabenh. Krypt. Fl. **1**: 117, 1881. Hab. in ovariis of *Veronica verna* L., Naugaum, Kashmir, 4-6-1953, leg. M. S. Pavgi. (Figs. 19—21).

This interesting genus so widely distributed on number of species of *Veronica* all over Europe, and as yet unkown in America, is being recorded for the first time in India. The infection is very severe, and owing to its systemic nature all the capsules of the plant are destroyed. The type of the species was collected on *Veronica praecox* in France. On the present host species *V. verna,* the fungus has been previously recorded from Czechoslovakia, Finland and Ukraine (Russia).

(7) *Sphacelotheca schweinfurthiana* (Thum.) Sacc. var. *minor* Zundel in Mycologia **35**: 168, 1943.

Sori in the ovaries, destroying all in the panicle and transforming them into long cylindrical pinkish-gray bodies, protruding beyond the

glumes, 8 to 12 mm long and 1.5 to 2 mm broad, rupturing irregularly at maturity exposing the dusty black spore mass, with a long simple columella in the centre. Mature spores cinamon-brown, subglobose to spherical, 6 to 10 μ in diameter with a mean of 8.4 μ; epispore thick, smooth to very faintly punctate. Cells of the false membrane hyaline to slightly cinnamon-yellow, smooth, grouped together in clusters, 10—15 μ in diameter.

Hab. in ovaries of *Saccharum munja* Roxb., Banaras, Uttar Pradesh, 18-4-1953, leg. M. S. Pavgi. (Figs. 22—25).

Sphacelotheca schweinfurthiana first described on the host *Imperata cylindrica* (L.) Beauv. from Sudan, has been recorded in India on *Saccharum munja* Roxb. The spores of this smut measures 10 to 12 μ with a mean of 11 μ. An almost similar smut with slightly smaller spores on *Saccharum arundinaceum* Retz. in China, was referred to as a new variety of *S. schweinfurthiana* by Zundel, with spore measurements 7—10 μ in diameter. The smut studied by us on *Saccharum munja* has also smaller spore measurements than *S. schweinfurthiana* recorded on the same host, and is therefore referred to var. *minor* designated by Zundel. We had no opportunity to examine the type material of *S. schweinfurthiana* var. *minor*.

(8) *Cintractia clintonii* Ciferri in Ann. Mycol. **26**: 29, 1928.

Sori ovaricolous, 1.5 to 2 mm in diameter, elongate, semiagglutinated, greyish-black and covered at first by a pinkish pseudomembrane which flakes away at maturity revealing the spore mass. Spores reddish-brown, subglobose to spherical, 12 to 15 μ in diameter with a mean of 12 μ. Epispore medium thick and densely verrucose. Sterile cells hyaline, thick-walled, smooth, 6 to 9.5 μ in diameter.

Hab. in ovaries of *Fimbristylis diphylla* Vahl. var *annua* C. B. Clarke. Banaras, Uttar Pradesh, 17-9-1952, leg. M. S. Pavgi. (Figs. 26—27).

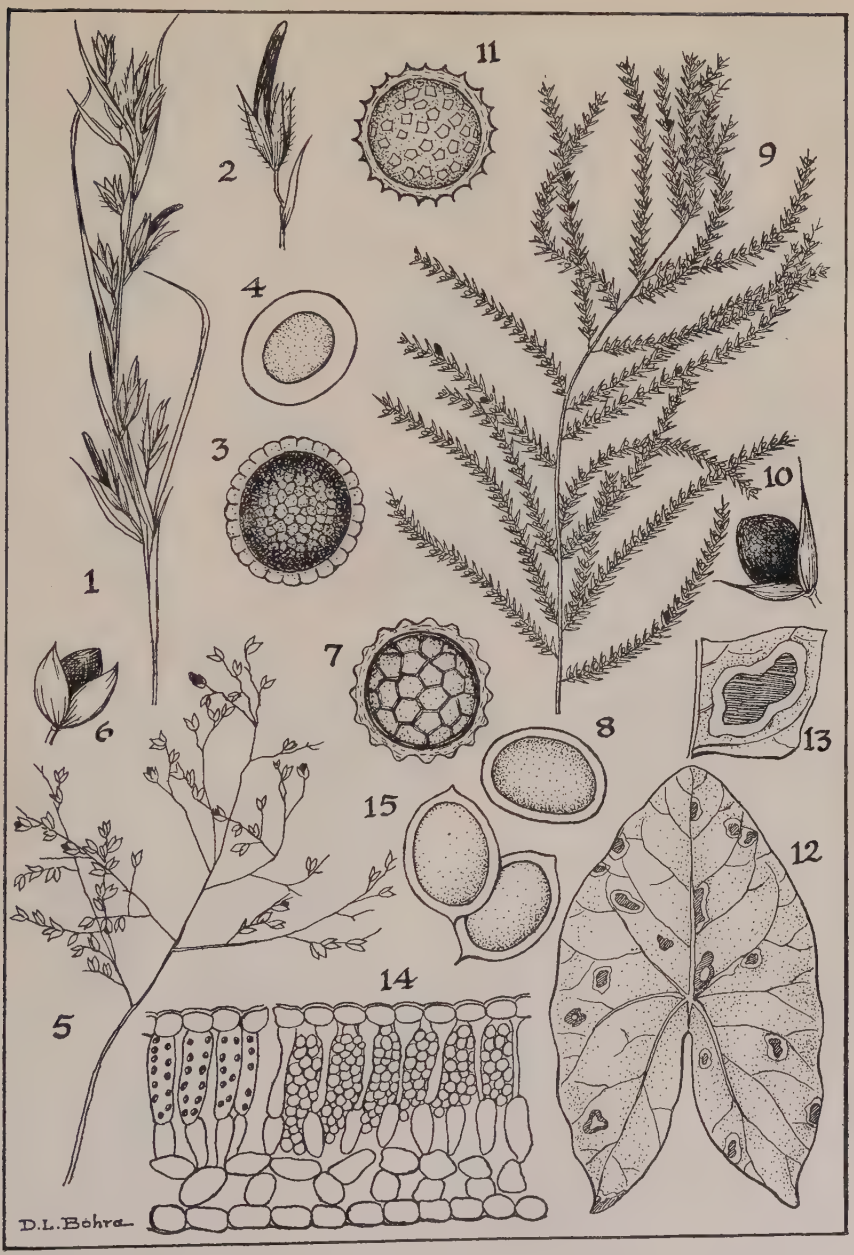
Cintractia clintonii with its characteristic verrucose spores which distinguishes it from *C. axicola* was first recorded from Mexico on *Fimbristylis holwayana*. The fungus has not previously been reported from India, and *F. diphylla* var. *annua* is also a new host.

(9) **Sphacelotheca kobresiae** (Mundkur) comb. nov.

Syn. *Cintractia kobresiae* Mundkur in Mycologia **36**: 291, 1944.

Sori in the ovaries, appearing as greyish-black bodies, 3 to 4 mm in diameter, covered by a whitish false membrane enclosing semi-agglutinated dark spore mass. Spores ovate-globoid to angular, 12—18 μ in diameter with a mean of 15 μ; epispore thick and verrucose. Cells of the false membrane thick-walled, spherical, columella short and stumpy.

Hab. in ovaries of *Kobresia laxa* Boeck. Satpura Nulla, Kashmir, leg. R. R. Stewart (Type). (Figs. 28—29).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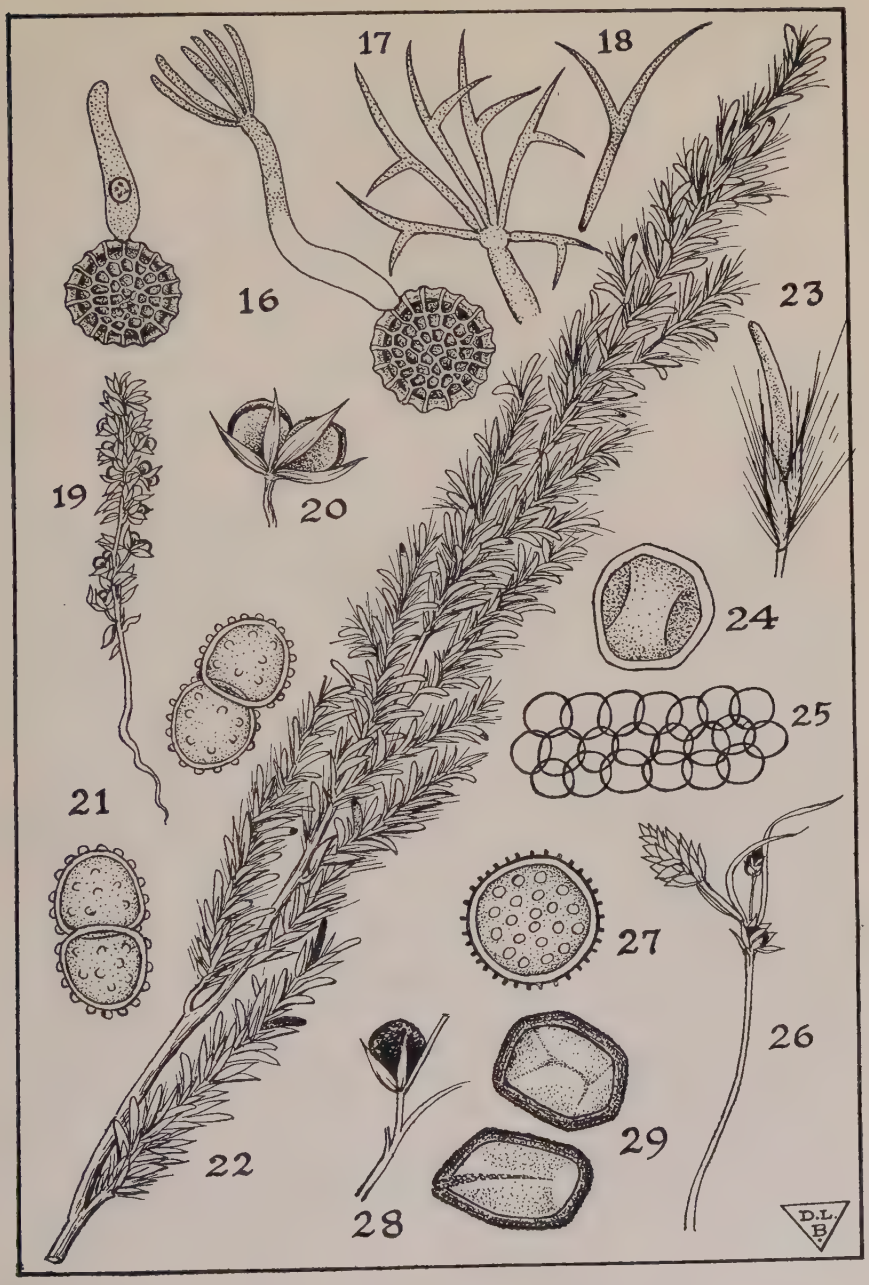
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A detailed examination of the sorus structure from the type material revealed that the fungus is a *Sphacelotheca* and not *Cintractia*. Except for the differences in the size of the spore, the fungus under study is identical with *Sphacelotheca eleocharidis* Thirumal. & Pavgi (Sydowia **7**: 99—100, 1953). Usually smut species with agglutinated spore mass are freely placed under *Cintractia* if they occur on members of the *Cyperaceae* and under *Sphacelotheca* if they parasitise graminaceous hosts. The sorus characters of the two genera are however very distinct. The development of spores from the base of the sorus vertically, and without radial strands of sterile hyphae in the smut on *Kobresia laxa* indicated that it is a species of *Sphacelotheca*.

In conclusion the writers wish to acknowledge their deep gratitude to Dr. F. Petrak, Vienna, for kindly translating the descriptions of new species into Latin.

Explanation of Plates I and II.

Figs. 1—4. *Tilletia themedae-anatherae*. Fig. 1. Habit, showing infection on *Themeda anathera* × 0.8 nat. size. Fig. 2. Sorus enlarged × 1.5 nat. size. Fig. 3. Chlamydospore × 1000. Fig. 4. Sterile cell × 1000.

Figs. 5—8. *Tilletia panici-humilis*. — Fig. 5. Infection on *Panicum humile*. × 0.8 nat. size. Fig. 6. Sorus enlarged × 4. Fig. 7. Chlamydospore × 1000. Fig. 8. Sterile cell × 1000.

Figs. 9—11. *Ustilago ornata*. — Fig. 9. Infection on *Leptochloa filiformis* × 0.8 nat. size. Fig. 10. Sorus enlarged × 4.8. Fig. 11. Chlamydospore × 1300.

Figs. 12—15. *Entyloma nymphaeae* var. *macrospora*. — Fig. 12. Infected leaf of *Nymphaea* × 0.8 nat. size. Fig. 13. Showing infection patch × 3.2. Fig. 14. Section through sorus × 120. Fig. 15. Chlamydospore × 1000.

Figs. 16—18. Germination of chlamydospores in *Tilletia eleusines*. — Fig. 16. Development of promycelium and sporidia × 800. Figs. 17 & 18. Formation of conjugation branches × 1000.

Figs. 19—21. *Schroeteria delastrina*. — Fig. 19. Systemically infected *Veronica verna* plant × nat. size. Fig. 20. Sorus in ovary. × 3.2. Fig. 21. Chlamydospore. × 1000.

Figs. 22—25. *Sphacelotheca schweinfurthiana* var. *minor*. — Fig. 22. Infected panicle of *Sacharum munja* × 1½ nat. size. Fig. 23. Sorus enlarged. × 3.2. Fig. 24. Chlamydospore. × 2000. Fig. 25. Sterile cells × 800.

Figs. 26—28. *Cintractia clintonii*. — Fig. 26. Habit on *Fimbristylis diphylla* var. *annua*. × 1½ nat. size. Fig. 27. Chlamydospore. × 1000. Fig. 28. Sorus of Sphacelotheca kobresiae. × 2.4. Fig. 29. Chlamydospore. × 1200.

Fungi of Mount Shasta.

(1936—1951).

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Introduction.

In a recent paper (9) certain brief notes were published concerning the ecology of the fungi of Mt. Shasta. These notes were limited to a discussion of the fungi in relation to the Merriam Life Zones, along with a few other brief items. In order to present a more detailed picture of the mycobiota of the mountain the following paper will present a few notes on the vegetation zones of the mountain followed by a host index to the fungi and a systematic list of the fungi including a discussion of the place of each species in the mycobiota in so far as known from the writer's collections and observations between 1936 and 1942 and in 1946 and 1947. Additional collections found in various herbaria, references in the literature, and a few collections made by the writer since 1947 are included to present as complete a picture as possible.

It is thought that Mt. Shasta forms a good basis for such a report since it is an isolated peak and the fungi and flowering plants (2, 6, 10) which grow upon it have been collected co-extensively during eight summers during which the writer lived at Horse Camp as custodian of the Shasta Alpine Lodge for the Sierra Club of California.

The Area Covered.

Location.

Mt. Shasta, a dormant volcano of the Cascade Range, is located in south central Siskiyou Co., in northern California. The limits within which collections have been made most intensively include the area above 4000 feet. In general, this is bounded on the west, south and east by a series of connecting roads through the chaparral between Mount Shasta, McCloud, Widow Springs and the Military Pass. From Andesite to Black Butte Station the area is bounded by the Southern Pacific Railroad, and between Black Butte Station and Mount Shasta by lanes through the brush fields east of Black Butte. This area roughly includes about 100 sections of land. It falls within the Mt. Shasta Recreation Area of the Shasta National Forest. The elevation

differential in the area is 4000 to 14,161 feet although few fungi have been collected above 10,000 feet.

Less than five per cent of the surface of the mountain is covered by vegetation directly affected by irrigation from springs and creeks which form meadows.

Vegetation Zonation.

To understand further the several habitat types found on the mountain the following summary of vegetation zonation is presented. This summary follows, as closely as possible, Daubenmire's system (17).

Alpine Zone

In the sense of Daubenmire (17) an „alpine tundra" occurs on the mountain but this is limited to sparse and scattered growth of numerous herbs and low woody perennials. If this zone is understood as including only that growth above the White Bark Pine zone then no shrub formation occurs in it. If it includes that growth above economic timberline, then, in association with white bark pines which occur as low shrubs, several of the shrubs associated with the white bark pines occur in it. The zone reaches from a ragged line of from 8000—10,000 feet to the summit of the mountain at 14,161 feet although flowering plants have not been found above 13,000 feet and the upper parts of the mountain appear to be inhabited solely by such plant life as thermal algae, red snow, and some lichens. Two principal types of habitat occur for plants: open sandy or gravelly lava flats which may be level or inclined, and cracks between boulders and beside rocks where moisture is held longer than in exposed places, While *Draba breweri* has been reported from as high as 13,000 feet, the highest record for a flowering plant on the mountain, no species is confined to this zone since all species found in it have also been found in the White Bark Pine zone and some species even as low as the Shasta Fir-Mountain Hemlock zone. In this zone springs and streams support no vascular vegetation.

Above the limits of woody plant growth, including white bark pines of a foot or less in height, few or no areas exist which contain the proper conditions for meadow or tundra formation. Water melting from the snow percolates so rapidly that no sod-forming plants have been able to become established. In some sandy openings in boulder fields, especially on gentle slopes where fragments of pumice bombs color the ground yellow, *Carex breweri* forms meadowlike patches; this plant forms clumps which enlarge year after year but the clumps are scattered in areas occupied by this species. Possibly this is the initial stage in a succession leading to a meadow. In the Shasta Fir-Mountain Hemlock and White Bark Pine zones *Juncus parryi*

inhabits more sheltered areas which remain covered with snow banks longer than less sheltered areas.

Phyllodoce empetriformis forms loose mats on level places or steep hillsides and gullys which receive a small amount of moisture from seepage after the snow has melted. However, in the colonies observed, except in the meadows to be described below, little soil, and no meadow had formed. The same conditions in a more restricted manner accompany colonies of the shrubby *Pentstemon menziesii* var. *davidsonii, Lutkea pectinata* and *Saxifraga tolmiei.*

At the moist side of rocks and boulders where a soil has formed through protection from wind erosion and evaporation of soil moisture numerous plants grow throughout the rock slopes from 8000 to 13,000 feet, although more and more sparsely above 10,000 feet. Other plants grow in more open places where the mountainside has formed a talus slope. Such conditions are common below 9000 feet and especially in the following zone.

White Bark Pine Zone.

This zone includes that area on the mountain in which trees occur at the highest altitude reached by woody plants even though at that altitude white bark pines may be no taller than six inches. Quantitative studies have not been made but by observation more than ninty per cent of the „forest" of this zone is composed of *Pinus albicaulis.* This zone follows ridges up to 10,000 feet and in some valleys remains as low as 8000 feet. In between these widely varying types of habitat the areas unfavorable for white bark pine growth are occupied by sparse vegetation of the Alpine zone. Particularly on the west and north slopes of Shastina this zone is best developed. Here on more or less gentle slopes uninterrupted by stream beds the forest forms a densely matted thicket ten feet high and gradually reduced to less than a foot high above. In these thickets, as elsewhere in this zone, dead branches of the trees throughout the snowless season are hard, dry and brittle.

On ridges and in valleys a few stunted Shasta firs occur with the white bark pines while one tree of *Abies concolor* has been observed on a ridge south of Horse Camp in this zone. Where hemlocks (*Tsuga mertensiana*) grow on the mountain they penetrate into this zone especially above Panther Creek, above Squaw Valley Creek, and north of Diller Canyon on Shastina. A number of shrubs also occurs in this zone. They may be found on exposed slopes as in the case of *Juniperus communis* var. *montanus,* they may form colonies isolated from the conifers by local conditions as in the case of certain large mats of *Holodiscus discolor* var. *glabrescens,* or they may occur in colonies intermingled with the white bark pines such as the mats of *Arctostaphylos nevadensis* and *Castanopsis sempervirens* in the

area between Cascade Gulch and Squaw Valley Creek. Occasional plants of *Haplopappus bloomeri* var. *angustatus* also occur in this zone. On the north bank of Diller Canyon a long tongue of chaparral pushes to the upper limits of this zone. This tongue includes representatives of most of the chaparral species to be found on the mountain. *Cercocarpus ledifolius* occurs in this zone on the north side of Shastina as does the only colony of *Populus tremuloides* on the mountain.

Below timberline, and in the timberline area, occasional springs occur around the mountain. Of these the highest occur above Horse Camp and above Panther Creek Meadows. Eight springs have been found in the area between Cascade Gulch and Squaw Valley Creek. One spring occurs in Diller Canyon and a number of springs along the bank of Mud Creek Canyon irrigate hanging gardens. The flow from these several springs is small and percolates within a few feet to a hundred feet or more from the source.

Squaw Valley Creek meadows originate in springs near the central part of this zone. Additional springs increase the flow of the stream as it descends through the meadows.

Shasta Fir-Mountain Hemlock Zone.

Shasta Fir Association.

Shasta Fir-Mountain Hemlock Association.

This is the most extensive zone on the principal slopes of the mountain. It is the Mt. Shasta version of Daubenmire's Fir-Mountain Hemlock zone of the Cascades. It comprises a forest belt extending at times for nearly 3000 feet in altitude. On the southwest side of the mountain the Shasta fir forms a pure stand penetrated only by an occasional specimen of *Pinus monticola* (only one has been observed in the southwest quadrant of the mountain) and by occasional species from zones above and below. From above, occasional white bark pines reach down into favorable habitats among the Shasta firs where they attain a greater size than in their own zone. Those species from below will be discussed later. In certain areas, especially at Panther Creek Meadows, Squaw Valley Creek meadows and north of Diller Canyon, the Shasta firs are partially or completely replaced by *Tsuga mertensiana*. These occur in dense stands, as scattered individuals, or as about half of the forest constituents in a mixture of Shasta fir. West of Mud Creek Canyon there is a mixed conifer forest in which *Pinus monticola* and hemlock occur with the Shasta firs in about equal quantity. There may be other such instances, where moisture relations and other factors permit. The best of these mixed forests lies between 7000 and 8000 feet on the north side of the mountain on the west bank of Bolam Creek where all the zones appear to be

pushed together. Here *Pinus monticola, Pinus albicaulis, Pinus contorta* var. *latifolia, Pinus ponderosa* and *Juniperus communis* var. *montana* grow together with the Shasta firs (*Abies magnifica* var. *shastensis*). An explanation of these mixed forests can best be made after more careful quantitative and qualitative studies of these colonies have been made.

In the Shasta Fir — Mountain Hemlock Zone a number of local variations produce special tree- shrub associations, or small grassy openings in the forest which could be termed dry meadows. Along small streams originating from springs or in the beds of which the water table is sufficiently high (in the case of intermittent streams) *Acer glabrum* and, sometimes, *Salix scouleriana* and *Cornus californica* form stream-bottom associations. In the heather meadows *Phyllodoce empetriformis, Kalmia polifolia* and *Vaccinium caespitosum* form an association which, at times, affects the bed of the stream by building up the bank of the stream. On the south side of Red Butte and in Mud Creek Canyon occur colonies of *Sambucus racemosus*.

Occasional openings occur in the Shasta fir forest. These may be related to the topography of the mountain, and appear to be related to the glacial pattern, although this is obscured by the great accumulation of lava sand and dust probably of morainal character which characterize the soil of these openings. In general, these openings, which range in size from a few hundred feet in diameter to a quarter mile in length and breadth, are characterized by the presence of two species of grasses, *Stipa occidentalis* and *Elymus elymoides (Sitanion hystrix)*. Forbs are also present. In those openings near Panther Creek Meadows above the Snowline Highway the dominant herb is *Polygonum davisiae*. In none of smaller openings is there enough herbage to present a horse with a good day's grazing. The grasses occur in scattered clumps and do not form a sod. In such a large dry meadow as the one between Panther Creek Meadows and Wagon Camp at the west end of Gray Butte *Haplopoppus bloomeri* var. *angustatus* occurs; this shrub also occurs in similar sandy openings at the east base of the mountain near the Mountainhouse Creek devastated area.

Extensive mats of *Arctostaphylos nevadensis* cover the ground in the climax forests of this zone. Apparently here it, too, is climax in contrast to the seral role assigned it by Oosting and Billings (27) in their description of the Red Fir forests of the Sierra Nevada. In this paper it is indicated that mountain manzanita is an invader after fire. On Mt. Shasta there is little or no evidence of this species invading burned areas exclusively since it is universal throughout this zone especially where Shasta firs form pure stands with no obvious evidence of having been burned. Both Shasta fir and mountain manzanita appear in the zone with old, mature, young and

seedling plants. Shrub invaders after fire are more commonly representatives of the seral chaparral to be described below.

Occasionally colonies of shrubs, especially of chaparral shrubs, occur in this zone. This is particularly true of locations which have lost their tree cover through extensive logging, or through the action of fires as a result of logging operations at lower elevations or as a result of lightning. Occasional individuals or colonies of chaparral shrubs may penetrate into the Shasta for zone because of favorable local factors such as exposed ridges, gully walls, etc. Occasional shrubs have migrated up partially wooded slopes to the limits of this zone as in the case of the association observed on the north side of Diller Canyon where a tongue of chaparral has penetrated to the White Bark Pine zone.

Of the springs noted under the White Bark Pine zone only a few overlap into the Shasta Fir zone and these occur mainly along Mud Creek Canyon where hanging gardens are formed along them on the precipitous canyon wall. One spring occurs on a tributary of Cascade Gulch and it percolates within a hundred feet of its source.

The springs which form the source of Panther Creek originate at the upper edge of this zone and springs both along the course of this stream and of Squaw Valley Creek increase the flow of water in these streams through this zone. If springs did not increase the flow of water in these streams percolation would reduce the extent of the meadows along them. The source of the spring water is melting snow; meadows and creeks are less extensive following winters of light snowfall.

Two large heather meadows occur on the mountain. They lie in the valleys of Panther Creek and Squaw Valley Creek. They possess a number of local variations but their pattern in general is the same. Through the meadow, in a meandering fashion and a times building its bed above the surrounding meadow, the clear creeks flow. The creeks are lined by large patches of heather, laurel and huckleberry. This situation occurs throughout the Shasta Fir zone. Panther Creek meadows are characterized by two large and one small meadow area separated by cascades through Shasta fir-mountain hemlock woods. Squaw Valley Creek meadows are characterized by three long narrow meadows separated by cascades, through similar forests, along which heather also grows. In addition to the springs in which the streams and meadows have their origin a number of spring and seepage areas occur along the meadows and cascades which increase the amount of water in the creek and which are characterized by local variations in the meadow plants. The most prominent of these variations is the swale of mountain rush in a depression east of Red Butte along one end of which Squaw Valley Creek flows.

Abies Concolor zone

At the lower limit of the Shasta Fir zone occurs an area of transition between it and the zone to be discussed next. This Zone is characterized especially in the area between Diller Canyon and Mud Creek Canyon by a predominance of Shasta fir and *Abies concolor.* Locally Douglas fir, ponderosa pine, sugar pine and incense cedar may occur here.

Since this transition occurs on the lower part of the more inclined slopes of the mountain few opportunities are available for meadow openings. However, the Wagon Camp meadows occur mostly in, or just below, this zone. More than in the Shasta Fir zone above, the chaparral penetrates into this area. One unusual shrub association occurs in this area; it is the patch of *Vaccinium occidentale* which dominates the boggy part of the Wagon Camp swamp, hardly more than a quarter acre in extent.

The best development of this zone lies on the southwest slope of the mountain between Cascade Gulch and Wagon Camp. It can be best seen along the Sisson Southern Trail.

This zone, which on a quantitative basis may later be better considered as an ecotone, is quite narrow where it exists, altough where favorable places for the growth of *Abies concolor* occur, tongues of this transition extend into the Shasta Fir zone. This is especially true where *Abies concolor* groves have replaced patches of chaparral on favorable slopes. Chaparral extends up into the Shasta Fir zone locally where fire has burned off the forest. When a grove of seedlings of white fir grow up they smother out the chaparral forming an island or tongue of white firs in the chaparral or at the edge of the Shasta Fir zone.

Sierra mixed Conifer Zone.

Ponderosa Pine — Sugar Pine — Douglas Fir — Incense Cedar Association.

This zone includes the lower forested slopes of the mountain, except on the north side, and probably at one time occupied those areas now covered with chaparral. Depending on logging conditions, or upon peculiarities of growth, isolated stands of one or more of the species of this zone occur locally. The zone includes *Pinus ponderosa, Pinus jeffreyi, Abies concolor, Pseudotsuga taxifolia, Pinus lambertiana* and *Libocedrus decurrens.* Depending upon conditions of logging and fire, tongues of forest reaching down into the chaparral are composed of one or more of these species. On more rugged hill sides and slopes all these species occur together as in the valley of Squaw Valley Creek and in the bed of Mud Creek Canyon where the bed fans out above the dam. While the valley of Cascade Gulch con-

tains a fairly mixed forest of these species, a lava flow just north of it contains a predominance of incense cedar and Douglas fir. At Bear Springs Jeffrey pine and incense cedar predominate, while that portion of Squaw Valley Creek below the McCloud water supply intake contains a Douglas fir-white fir forest, the most luxurient forest on the mountain. On the north side of the mountain east of Bolam Creek this zone extends above its altitudinal limits of the south side (5500 ft.) to about 7000 feet where it blends with the Shasta Fir zone as noted above. On the northeast side of the mountain, where Military Pass is formed between the mountain and Whaleback or Black Crater, a volcanic ridge to the north, *Pinus contorta* var. *latifolia* has assumed control of a considerable area of rolling land. This lodgepole pine grove is surrounded on more level places with the ponderosa pine forest while above it merges into the Shasta fir forest. On the south side of the mountain occur several colonies of knobcone pine (*Pinus attenuata*) in this zone. The trees are scattered and rarely form a solid stand.

In the Sierra Mixed Conifer zone occur the several springs on the southwest and south sides of the mountain with which most visitors are familiar: Bear Springs, at which a large grassy meadow occurs, MacBride Springs and Widow Springs, at both of which are Public Camps. Also in this zone the spring at the base of Squaw Valley Creek forms the intake for the McCloud water supply. Near Black Butte Station, north of Black Butte and near Weed, is a small spring in a group of conifers which percolates near its source.

Seral Chaparral Association.

Portions of the Mixed Conifer Zone are composed of a seral (secondary), rather than a climax (primary), chaparral. Tongues of this scrub reach up into the Shasta Fir zone and even to the White Bark Pine zone. It covers the gentler slopes of the mountain giving them the aspect, from a distance, of a green rolling plain. From the Widow Springs area west and north to the west slopes of Shastina this scrub includes a number of shrubs of which the most conspicuous are *Arctostaphylos patula, Ceanothus velutinus, Castanopsis chrysophylla* and *Prunus emarginata.* From somewhat north of Cascade Gulch to the Military Pass this chaparral includes *Purshia tridentata.* Creeks and springs in this area are characterized by *Salix scouleriana, Cornus nuttallii,* as well as, occasionally, isolated trees or groves of trees of the zone and other shrub species. This occasional occurrence of trees among the chaparral, in isolated colonies, on rock outcroppings or along creeks, with intervening charred snags or sawed stumps, leads to the conclusion that the chaparral forms a temporary cover as a result of intensive logging and burning of the area. This is especially true of the area south of Diller Canyon.

In the area occupied by the chaparral occur springs from which flow large volumes of water. Above 4000 feet on the mountain the more important of these is the one at Howard which forms the water supply for the City of Mount Shasta. The big springs which enter the Sacramento, McCloud, Pit and Shasta Rivers are not considered here since they occur below 4000 feet.

The recent republication (19) of a report of an ascent of Mount Shasta in 1856 indicates that even in the gold rush days before intensive logging started in the area there was a chaparral vegetation between the community now known as Mount Shasta and the lower forests of yellow and sugar pines.

The U. S. Forest Service has started to reclaim, with some success, some of these chaparral covered areas by planting ponderosa pine seedlings in the area through which the Shasta Snowline Higway crosses the chaparral.

Ponderosa Pine Association.

On the north side of the mountain, below 6500 feet, between Inconstance and Bolam Creeks, occurs a large stand of *Pinus ponderosa* in which the forest is open and no other trees occur. It is a tongue of forest reaching up into the Mixed Conifer Zone. It has been logged but not completely and fires have occurred in it more recently than in other forests on the mountain itself. The south and west sides of the mountain, even as low as 3500 feet at the City of Mount Shasta, show no sign of having had a purely ponderosa pine forest since isolated groves of trees in the chaparral and villages are composed of more than one Sierra Mixed Conifer Zone species.

Cercocarpus-Purshia Association.

On the north side of the mountain, between the Lava Parks and the Military Pass, thus occupying a larger base than the previous zone, the lower slopes of the mountain, down to below 4000 feet, are covered with a shrub formation which appears to be an extension of the Juniper-Pinon Zone, or at least a transition between the Sierra Mixed Conifer Zone and the Juniper-Pinon Zone. On the open lava parks and the sandy areas at the base of the mountain the area is covered mostly with *Purshia tridentata* and *Cercocarpus ledifolius.* The former also grows in the chaparral on the southwest side of the mountain, especially near MacBride Springs, south of the lava parks. The latter also occurs as far up the mountain as the „Ghost Forest" of the White Bark Pine zone near the upper end of one of the lava parks. At the lower edge of this area on the mountain occur occasional shrubs of *Artemisia tridentata,* occasional trees of *Juniperus californica* var. *utahensis,* and *Pinus ponderosa,* colonies of *Chrysothamnus nauseosus* var. *occidentalis,* and scattered shrubs or low trees of *Quercus chrysolepsis.* The Juniper-Pinon Zone

extends north into the Shasta Valley at somewhat lower elevations and northeast along the base of Whaleback or Black Crater where the juniper occurs in fairly well developed woodlands.

Host Index.

The following list is not considered complete and further collections may add to the list of species of various fungi, and add to the lists of hosts on which fungi occur here. It consolidates previously published lists and notes (1, 2, 5, 6, 8, 9, 10, 13, 14, 15, 19, 24), and includes data from at least two other lists of collections made in California and the western states.

ON TREES.

Abies concolor. — *Aleurodiscus amorphus* — *Auricularia auricularis* — *Clavaria abietina* — *Cryptoporus volvatus* — *Dasyscypha arida* —*Echinodontium tinctorum* — *Fomes officinalis* — *Fomes pinicola* — *Ganoderma applanatum* —*Guepiniopsis alpinus* — *Helvella californica* — *Herpotrichia nigra* — *Hirschioporus abietinus* — *Hypoderma robustum* — *Hypodermella abietis-concoloris* — *Hypoxylon diathrauston* — *Lophodermina autumnale* — *Merulius bellus* — *Merulius ravenelii* — *Mycena griseoviride* — *Mycena lilacifolia* — *Phlebia albida* — *Phlebiella candidissima* — *Poria ferrea* — *Pucciniastrum goeppertianum* — *Rhizomorpha subterranea* — *Serpula americana* — *Solenia candida* — *Spongiporus leucospongia* — *Stereum rugisporum.*

Abies magnifica var. *shastensis* — *Acremonium ?verticillatum* — *Aleurodiscus amorphus* — *Aleurodiscus roseus* — *Armillaria mellea* — *Aurantioporellus alboluteus* — *Bertia moriformis* — *Cenangium* sp. — *Chaetomium murorum* — *Chloridium* sp. — *Ciboria rufo-fusca* — *Clavaria ?decurrens* — *Clavaria pinicola* — *Clithris crispa* — *Coniophora olivaceus* — *Corticium bicolor* — *Corticium corruge* — *Corticium cremoricolor* — *Corticium galactinum* — *Corticium luridum* — *Corticium radiosum* — *Corticium scutellare* — *Corticium* spp. — *Crepidotus* sp. — *Cryptoporus volvatus* — *Cylindrocolla* sp. — *Dacrymyces deliquescens* — *Dasyscypha agassizii* — *Dasyscypha arida* — *Dasyscypha serinella* — *Dendryphium pini* — *Durella ?compressa* — *Echinodontium tinctorum* — *Flammula penetrans* — *Fomes annosus* — *Fomes nigrolimitatus* — *Fomes officinalis* — *Fomes pinicola* — *Fomes subroseus* — *Fusicoccum bacillare* — *Ganoderma oregonense* — *Geopyxis cupularis* — *Gibbera* sp. — *Gloeophyllum sepiarium* — *Guepiniopsis alpinus* — *Herpotrichia nigra* — *Hirschioporus abietinus* — *Humaria scutellata* — *Hyaloscypha atomaria* — *Hypoderma abietinum* — *Hysterium acuminatum* var. *alpinum* — *Hysterographium formosum* — *Lachnellula chrysophthalma* — *Laetiporus sulphureus* — *Lasiosphaeria vermiculata* — *Lentinus* sp. — *Lophodermium piceae* — *Melomastia shastensis* — *Merulius atropurpureus* — *Merulius bellus* — *Merulius ceracellus* — *Merulius fugax* — *Merulius ravenelii* — *Mollisia shastensis* — *Mycena griseoviride* — *Mycena lilacifolia* — *Mycoacia alboviride* — *Odontotrema minus* — *Oidium magnisporum* — *Ollula pezizoidea* — *Patellea umbrorum* — *Patinella abietina* — *Paxillus panuoides* — *Pellicularia flavescens* — *Peniophora pallidula* — *Peniophora (near) subulata* — *Peniophora cornosa* — *Peniophora exima* — *Peniophora* spp. — *Periconia* sp. — *Phlebia albida* — *Phlebiella candidissima* — *Pholiota*

involuta — Phoma sp. — *Pleurotus petalloides — Poria albolutescens — Poria asiatica — Poria ferrea — Poria ferrugineo-fusca — Poria ferruginosa — Poria lenis — Poria sinuosa — Poria subincarnata — Poria tenuis — Poria versipora — Poria xantha — Porodaedalea pini — Pseudohydnum gelatinosum — Rhizomorpha subterranea — Scleroderris ?abieticola — Sepedonium chrysospermum — Serpula americana — Solenia candida — Sphaeridium luteum — Spongipellis borealis — Spongiporus leucospongia — Stagonospora* sp. — *Stereum rugisporum — Stilbum tomentosum* var. *ovalisporum — Tomentella* sp. — *Trechispora brinkmannii — Trichoderma viride — Trichoscyphella tenuipilosa — Trichosphaeria solaris — Trichothecium roseum — Tulasnella fuscoviolacea — Tulasnella* sp. — *Verticillium* sp.

Juniperus occidentalis. — *Fulvifomes juniperinus.*

Libocedrus decurrens. — *Arthrobotryum spongiosum — Cryptoporus volvatus — Dacrymyces deliquescens — Dothiorella magnifructa — Fomes amarus — Gymnosporangium libocedri — Humaria scutellata — Peniophora* sp. — *Solenia candida — Stigmatea sequoiae — Tryblidiella macrospora.*

Pinus albicaulis. — *Cephalosporium* sp. — *Dasyscypha arida — Dasyscypha agassizii — Dasyscypha serinella — Guepiniopsis alpina — Hypodermella* sp. — *Hysterographium formosum — Lentinus lepideus — Lophodermina nitens — Mycosphaerella* sp. — *Neopeckia coulteri — Patinella albo-viridis — Phoma harknessii — Sclerotium* sp. — *Spongiporus leucospongia — Trichothecium roseum — Tympanis pithya.*

Pinus attenuata. — *Dacrymyces deliquescens — Merulius bellus — Thyrenula* sp. — *Tyromyces caesius.*

Pinus contorta var. *latifolia.* — *Cronartium comptoniae.*

Pinus lambertiana. — *Armillaria mellea — Dasyscypha arida — Fomes officinalis — Lophodermium pinicolum.*

Pinus ponderosa (including *Pinus jeffreyi).* — *Aleurodiscus amorphus — Corticium ?centrifugum — Corticium pelliculare — Cronartium pyriforme — Cryptoporus volvatus — Dacrymyces deliquescens — Dacrymyces palmatus — Elytroderma deformans — Hypodermella medusa — Lentinus lepideus — Lophodermium pinicolum — Merulius vastator — Pellicularia subcoronata — Pellicularia vaga — Peniophora gracillima — Peniophora sanguinea — Peniophora sp. — Poria rufa — Serpula americana.*

Pinus ponderosa boards at Horse Camp (8000 ft.). — *Acanthonitschkia coloradense — Acremonium verticillatum — Guepiniopsis alpina — Hysterium acuminatum* var. *alpinum — Tyromyces caesius.*

Pseudotsuga taxifolia. — *Cryptoporus volvatus.*

Quercus kelloggii. — *Aleurodiscus roseus — Corticium* spp. — *Dacrymyces deliquescens — Cytidia* sp. — *Odontia cristulata — Pellicularia* sp. — *Peniophora cinerea* (group) — *Peniophora ?incarnata — Stereum ?hirsutum — Tremella mesenterica.*

Tsuga mertensiana. — *Aurantioporellus alboluteus — Clithris ?crispa — Corticium corruge — Dasyscypha agassizii — Dasyscypha serinella — Fomes annosus — Fomes nigrolimitatus — Fomes officinalis — Fomes pinicola — Guepiniopsis alpina — Herpotrichia nigra — Hysterium acuminatum* var. *alpinum — Lentinus* sp. — *Merulius bellus — Poria lenis — Poria tsugina — Poria vaporaria — Serpula americana — Spongiporus leucospongia — Stereum rugisporum.*

Acer glabrum. — *Auricularia auricularis* — *Cryptosporella acerina* — *Lachnum bicolor* — *Massarinula lignorum* — *Septoria circinata* — *Septoria curvispora* — *Septoria marginata.*

Amelanchier pallida. — *Gymnosporangium libocedri.*

Arctostaphylos nevadensis. — *Aleurodiscus diffisus* — *Cryptostictis arbuti* — *Exobasidium vaccinii* — *Exobasidium vaccinii-uliginosii* — *Gloniella lapponica* — *Mollisia shastensis* — *Phyllosticta amicta* — *Pucciniastrum sparsum* — *Rosellinia subsimilis* — *Tapesia ?fusca* — *Tapesia melaleucoides* var. *vaccinii.*

Arctostaphylos patula. — *Aleurodiscus diffisus* — *Aleurodiscus fruticetorum* — *Aleurodiscus roseus* (complex) — *Corticium* sp. — *Cryptostictis arbuti* — *Dacrymyces deliquescens* — *Dasyscypha nivea* — *Exobasidium vaccinii-uliginosii* — *Fomes igniarius* var. *arctostaphyli* — *Godronia castanopsidis* — *Hymenochaete tabacina* — *Odontia crustosa* — *Patellea californica* — *Peniophora* sp. — *Pucciniastrum sparsum* — *Rosellinia subsimilis* — *Spongiporus leucospongia* — *Stereum hirsutum.*

Artemisia tridentata. — *Puccinia absinthii.*

Berberis piperiana. — *Cumminsiella mirabilissima.*

Castanopsis chrysophylla. — *Dothidella janus* — *Godronia castanopsidis* — *Hymenochaete tabacina* — *Lachnum bicolor* — *Taphrina castanopsidis.*

Castanopsis sempervirens. — *Rutstreemia* sp.

Ceanothus velutinus. — *Aleurodiscus fruticetorum* — *Cytidia stereoides* — *Dasyscypha succinea* — *Hymenochaete spreta* — *Hymenochaete tabacina* — *Hypoxylon serpens* — *Lachnum bicolor* — *Peniophora* spp.

Cercocarpus ledifolius. — *Coriolus versicolor* — *Corticium* spp. — *Cytidia stereoides* — *Dacrymyces deliquescens* — *Dasyscypha flammea* — *Merulius bellus* — *Peniophora cinerea* (group) — *Peniophora ?incarnata* — *Poria ?tenuis.*

Chrysothamnus nauseosus var. *occidentalis.* — *Epochnium isthomorphum* — *Macrophoma chrysothamni* — *Puccinia grindeliae*

Crategus douglasii. — *Gymnosporangium libocedri.*

Haplopappus bloomeri var. *angustatus.* — *Dasyscypha flammea* — *Dasyscypha aplopappi* — *Dasyscypha salmonea* — *Lophiostoma brenckleanum* — *Mollisia hysterioides* — *Puccinia grindeliae* — *Rosellinia riminicola* — *Teichospora megastega.*

Holodiscus discolor var. *glabrescens.* — *Helotium ?virgultorum* — *Pyronelia sirodesmoides.*

Juniperus communis var. *montanus.* — *Herpotrichia ?nigra* — *Lophodermina juniperina.*

Kalmia polifolia. — *Venturia kalmiae.*

Phyllodoce empetriformis. — *Belonopsis* sp. — *Leciographa dispersa* — *Patinella abietina.*

Polygonum shastense. — *Ustilago shastense.*

Populus tremuloides. — *Melampsora albertensis.*

Prunus demissa. — *Dibotryon morbosum* — *Septoria pruni* — *Taphrina confusa.*

Prunus emarginata. — *Dasyscypha succinea* — *Polyporus elegans* — *Taphrina flectens.*

Prunus subcordata. — *Taphrina pruni-subcordatae.*

Purshia tridentata. — *Cytidia stereoides* — *Dacrymyces deliquescens* — *Orbilia coccinella* — *Peniophora* spp. *Peniophora assimilis* — *Thyridaria californica.*

Quercus chrysolepis. — *Corticium* sp. — *Dacrymyces deliquescens* — *Stereum ?hirsutum.*

Rhamnus purshiana. — *Cylindrosporium rhamni* — *Septoria variegata.*

Rosa gymnocarpa. — *Phragmidium rosae-californicae.*

Rubus leucodermis. — *Phragmidium imitans.*

Rubus occidentalis. — *Phragmidium occidentale.*

Salix scouleriana. — *Lophium dolabriforme* — *Melampsora ribesii-purpurae* — *Patellea californica* — *Solenia anomala* — *Stereum ?hirsutum* — *Torula ?crustacea* — *Tremella mesenterica.*

Salix sitchensis. — *Melampsora arctica.*

Sambucus glauca. — *Exosporium penduculatum.*

Sambucus racemosus. — *Brachysporium oosporum* — *Corticium corruge* — *Lasmeniella alpina.*

Symphoricarpos acutus. — *Puccinia crandallii.*

Vaccinium caespitosum. — *Exobasidium vaccinii* — *Pucciniastrum goeppertianum* — *Pucciniastrum myrtillii.*

Vaccinium membranaceum. — *Pucciniastrum myrtillii.*

ON GRASSES, SEDGES AND RHUSES.

Agrostis exarata. — *Erysiphe graminis*

Agrostis thurberiana. — *Hendersonia sp.* — *Leptosphaeria microscopica* — *Pleospora herbarum* — *Scelobelonium melanosporum.*

Agrostis sp. — *Cladosporium herbarum* — *Leptosphaeria vagans* — *Mycosphaerella agrostidis.*

Bromus carinatus. — *Puccinia glumarum* — *Ustilago bullata,*

Bromus marginatus. — *Scolecotrichum graminis.*

Bromus tectorum. — *Ustilago bullata.*

Carex amplectens. — *Puccinia caricis.*

Carex bolanderi. — *Phyllosticta caricis.*

Carex brainerdii. — *Puccinia extensicola.*

Carex breweri. — *Phoma caricis* — *Phoma herbicola.*

Carex fracta. — *Cladosporium herbarum* — *Mycosphaerella tassiana* — *Septoria lunelliana.*

Carex kelloggii. — *Puccinia caricis.*

Carex multicaulis. — *Cintractia caricis* — *Metasphaeria sepalorum* — *Puccinia atrofusca.*

Carex nigricans. — *Cintractia caricis.*

Carex spectabilis. — *Cintractia caricis* — *Cintractia externa* — *Leptosphaeria* sp. — *Pleospora elynae.*

Carex whitneyi. — *Puccinia caricis.*

Carex spp. — *Cladosporium herbarum* — *Hendersonia distans* — *Leptosphaeria vagans* — *Phialea* sp. — *Puccinia atrofusca.*

Elymus elymoides (Sitanion hystrix). — *Cladosporium herbarum* — *Erysiphe graminis* — *Leptostromella hysterioides* f. *graminicolum* — *Puccinia glumarum* — *Scolecotrichum graminis* — *Selenophoma obtusa* — *Ustilago spegazzinii* var. *agrestis.*

Elymus glaucus. — *Puccinia glumarum* — *Scolecotrichum graminis* — *Selenophoma obtusa* — *Urocystis agropyri* — *Ustilago striaeformis.*

Elymus glaucus var. *jepsonii.* — *Puccinia glumarum.*

Elymus hansenii (Sitanion hansenii). — *Puccinia glumarum* — *Puccinia pattersoniana* — *Scolecotrichum graminis* — *Selenophoma obtusa* — *Ustilago spegazzinii* var. *agrestis.*

Glyceria elata. — *Scolecotrichum graminis.*

Holcus lanatus. — *Puccinia rubigo-vera.*

Juncus balticus var. montanus. — *Arthrinium cuspidatum* — *Leptosphaeria* sp. — *Leptosphaeria caricinella* — *Leptosphaeria junciseda* — *Lophium* sp. — *Mycosphaerella tulasnei* — *Pleospora* sp. — *Pleospora trichostoma* — *Scelobelonium melanospermum.*

Juncus mertensiana. — *Pleospora elynae.*

Juncus orthophyllus. — *Leptosphaeria culmorum* — *Leptosphaeria junciseda* — *Leptosphaeria michotii* — *Typhula* sp.

Juncus parryi. — *Aposphaeria mollis* — *Bifusella acuminata* — *Dothidella junci* — *Metasphaeria sepalorum* — *Uromyces junci.*

Juncus spp. — *Cladosporium herbarum* — *Heteropatella umbilicata.*

Luzula subcongesta. — *Septoria minuta.*

Melica californica. — *Septoria nodorum.*

Phleum alpinum. — *Leptosphaeria typharum* — *Leptosphaeria vagans* — *Mycosphaerella tulasnei* — *Mycosphaerella* sp.

Phleum sp. — *Cladosporium herbarum.*

Poa pratensis. — *Arthrinium cuspidatum* — *Erysiphe graminis* — *Dendryphium* sp. — *Helminthosporium vagans* — *Puccinia poae-sudeticae.*

Stipa californica. — *Clathrospora cookei* — *Leptosphaeria heterospora* — *Ustilago spegazzinii* var. *agrestis.*

Stipa columbiana var. *nelsonii.* — *Stagonospora simplicior.*

Stipa occidentalis. — *Ascochyta oudemansii* — *Scolecotrichum graminis* — *Ustilago williamsii.*

Trisetum spicatum. — *Cladosporium herbarum* — *Leptosphaeria heterospora* — *Leptosphaeria microscopica* — *Leptosphaeria vagans* — *Mycosphaerella tulasnei* — *Puccinia rubigo-vera.*

ON HERBS

Agoseris gracilens. — *Heteropatella umbilicata.*

Agoseris grandiflora. — *Puccinia hieracii.*

Agoseris heterophylla. — *Puccinia hieracii.*

Agoseris scorzoneraefolia. — *Puccinia hieracii.*

Allium validum. — *Apiosporella minuli* — *Heterosporium allii* — *Mycosphaerella schoenoprasi* — *Mycosphaerella tassiana* — *Pezizella ?helotioides* — *Uromyces aterrimus* — *Uromyces aureus.*

Anaphalis margaritacea. — *Uromyces amoenus.*

Anemone occidentalis. — *Clathrospora diplospora* — *Pleospora permunda* — *Scelobelonium melanosporum* — *Urocystis sorosporioides.*

Aquilegia formosa. — *Puccinia rubigo-vera* var. *agropyri.*

Arabis sp. — *Puccinia monoica.*

Arabis platysperma. — *Microthyrium microscopicum* — *Pleospora permunda* — *Puccinia monoica* — *Sirexcipula wyomingensis* — *Sphaerotheca macularis.*

Arabis platysperma var. *howellii.* — *Micosphaerella tassiana.*

Arnica longifolia ssp. *myriadenia.* — *Apiosporella alpina.*

Arnica mollis. — *Sphaerotheca macularis* var. *fuliginea.*

Arnica viscosa. — *Hysteropezizella* sp. — *Lachnum setigerum* — *Leptosphaeria doliolum* — *Leptosphaeria heterospora* — *Phoma* sp. — *Pleospora anthyllidis* — *Pleospora herbarum* — *Titaea* sp. — *Typhula* sp.

Asarum hartwegii. — *Puccinia asarina* — *Synchytrium asari.*

Asclepias cornuta. — *Cercospora clavata.*

Aster occidentalis. — *Puccinia extensicola* var. *asteris.*

Aster shastensis. — *Coleosporium solidaginis* — *Heterosphaeria* sp. — *Pleospora ambigua* var. *ambigua* — *Pyrenophora hispida* — *Septoria shastensis.*

Brickellia grandiflora. — *Puccinia subdecora.*

Brunella vulgaris. — *Linospora brunellae.*

Calochortus nudus. — *Puccinia calochortii.*

Calyptridium umbellatum var. *caudicifera.* — *Uromyces spragueae.*

Cardamine bellidifolia var. *pachyphylla.* — *Puccinia cruciferearum.*

Castilleja arachnoidea var. *shastensis.* — *Nectriella pedicularis* — *Phoma herbarum* — *Pleospora* sp. — *Sphaeropsis microspora.*

Castilleja miniata. — *Clathrospora diplospora* — *Heteropatella umbilicata* — *Typhula* sp.

Castilleja pinctorum. — *Pleospora permunda* — *Pyrenophora fenestrata.*

Chamaesaracha nana. — *Puccinia chamaesarachae.*

Chimaphila umbellata. — *Pucciniastrum pyrolae.*

Cicuta occidentalis. — *Puccinia cicutae.*

Circaea pacifica. — *Puccinia circaeae.*

Claytonia siberica. — *Ramularia claytoniae.*

Clematis ligusticifolia. — *Puccinia rubico-vera* var. *agropyri.*

Comandra umbellata. — *Puccinia comandrae.*

Cryptantha affinis. — *Erysiphe cichoracearum.*

Cycladenia humulis. — *Pleospora permunda.*

Cymopteris terebinthinus. — *Puccinia jonesii* var. *cymopteri* — *Puccinia pseudocymopteri.*

Delphinium pauciflorum. — *Ramularia delphinii.*

Dodocatheon sp. — *Puccinia melanconioides.*

Epilobium adenocaulon. — *Puccinastrum pustulatum.*

Epilobium angustifolium. — *Pucciniastrum pustulatum.*

Epilobium clavatum. — *Puccinia scandica.*

Epilobium hornemannii. — *Sphaerotheca epilobii.*

Epilobium lactiflorum. — *Sphaerotheca epilobii.*

Epilobium ?minutum. — *Puccinia vagans.*

Erigeron inornatus. — *Erysiphe cichoracearum.*

Eriogonum latifolium ssp. *nudum.* — *Uromyces intricatus.*

Eriogonum marifolium. — *Belonioscypha campanula* — *Erysiphe polygoni* — *Mollisia shastensis* — *Phoma eriogoni* — *Uromyces intricatus.*

Eriogonum pyrolaefolium. — *Cytospora eriogoni* — *Mollisia shastensis.*

Eriogonum umbellatum ssp. *polyanthum.* — *Uromyces intricatus.*

Eupatorium occidentale. — *Pleospora herbarum.*

Euphorbia crenulata. — *Melampsora euphorbiae-gerardianae* — *Uromyces proeminens* var. *proeminens.*

Euphorbia serpyllifolia. — *Uromyces proeminens* var. *proeminens.*

Fragaria californica. — *Ramularia tulasnei.*

Fritillaria atropurpurea. — *Phyllosticta fritillariae.*

Gayophytum diffusum. — *Puccinia vagans* var. *gayophytii.*

Gayophytum ramosissimum. — *Puccinia vagans* var. *gayophytii.*

Gilia aggregata. — *Heteropatella conglutinata.*

Godetia quadrivulnera. — *Puccinia vagans.*

Habenaria unalaschensis. — *Aecidium graebnerianum.*

Hieracium sp. — *Puccinia sejuncta.*

Hieracium albiflorum. — *Puccinia hieracii.*

Hieracium cynoglossoides var. *nudicaule.* — *Entyloma compositarum* — *Sporobolomyces roseus.*

Hieracium gracile. — *Puccinia hieracii.*

Hulsea nana. — *Typhula* sp.

Hypericum perforatum. — *Uromyces hyperici.*

Iliamna bakeri. — *Phoma* sp. — *Pleospora herbarum.* — *Selenophoma linicola.*

Kelloggia galioides. — *Phyllosticta crustosa.*

Lathyrus lanzswertii var. *aridus.* — *Ascochyta pisi* — *Macrosporium puccinioides* — *Septoria astragali* — *Uromyces fabae.*

Ligusticum grayi. — *Heteropatella umbilicata* — *Nyssopsora echinata* — *Pleospora permunda* — *Puccinia ligustici* — *Septoria aromatica* — *Synchytrium aureum.*

Lilium columbianum. — *Uromyces holwayi.*

Linium micranthum. — *Melampsora lini.*

Lotus torreyi. — *Ovularia lotophaga.*

Lupinus albicaulis var. *shastensis.* — *Apiosporella ?alpina* — *Hysteropezizzella* sp. — *Leptosphaeria maculans* — *Leptosphaeria planiuscula* — *Phyllosticta ferax* — *Pleospora amplispora* — *Pleospora balsamorhizae* — *Pleospora compositarum* — *Pleospora gigaspora.*

Lupinus latifolius. — *Uromyces occidentalis.*

Lupinus obtusilobus. — *Diplodia lupini* — *Hysteropezizella* sp. — *Leptosphaeria millefolii* — *Mycosphaerella aquilegiae* — *Pleospora balsamorhizae* — *Pleospora gigaspora* — *Rhynchostoma exasperans* — *Septoriella* sp. — *Typhula* sp.

Madia gracilis. — *Coleosporium madiae.*

Mimulus tilingii. — *Ramularia mimuli.*

Mitella pentandra. — *Puccinia heucherae.*

Monardella odoratissima. — *Phyllosticta monardellae* — *Placosphaeria shastensis* — *Pleospora diplospora* — *Pleospora permunda* — *Puccinia menthae* — *Stemphyllium* sp.

Oxyria digyna. — *Puccinia oxyriae.*

Osmorhiza chilensis. — *Puccinia pimpinellae.*

Pedicularis densiflora. — *Puccinia rufescens* — *Ramularia obducens.*

Pentstemon deustus ssp. *deustus.* — *Puccinia pentstenomis.*

Pentstemon gracilentus. — *Heteropatella umbilicata.* — *Pleospora permunda* — *Scelobelonium melanosporum.*

Pentstemon menziesii var. *davidsonii.* — *Dimerum alpinum* — *Puccinia palmeri.*

Pentstemon newberryi — *Puccinia palmeri.*

Pentstemon shastensis. — *Ramularia pentstemonis.*

Phacelia leucophylla. — *Pestalotia* sp.

Phacelia mutabilis. — *Erysiphe cichoracearum.*

Phlox douglasii. — *Dasyscypha phlogis* — *Lophodermium phloxii* — *Macrophoma cylindrospora* — *Mollisia hysterioides* — *Pleospora tragacanthae* — *Puccinia douglasii.*

Phoradendron libocedri. — *Botryosphaerostroma viscii.*

Potentilla flabellifolia. — *Taphrina potentillae.*

Potentilla glandulosa ssp. *nevadensis.* — *Marssonina potentillae* — *Taphrina potentillae.*

Potentilla gracilis ssp. *nuttallii.* — *Phragmidium ivesiae.*

Pyrola dentata var. *integra.* — *Pucciniastrum pyrolae.*

Pyrola picta. — *Pucciniastrum pyrolae.*

Ramischia secunda. — *Pucciniastrum pyrolae.*

Salvia sonomensis. — *Puccinia mellifera.*

Saxifraga tolmiei. — *Sirexcipula wyomingensis.*

Senecio aronicioides. — *Ramularia senecionis* var. *carniolica.*

Senecio triangularis. — *Mycosphaerella tassiana.*

Silene douglasii var. *douglasii.* — *Diplodina silenes* — *Pleospora balsamorhizae* — *Pleospora herbarum* — *Ustilago violacea.*

Silene grayi. — *Ustilago violacea.*

Sisymbrium altissimum. — *Albugo candida.*

Smilacina stellata. — *Cylindrosporium smilacinae* — *Heterosporium* sp.

Stellaria longipes. — *Melampsorella cerastii.*

Stephanomeria lactucina. — *Puccinia harknessii.*

Streptanthus orbiculatus. — *Nemosphaera shastensis* — *Typhula* sp.

Taraxacum officinale. — *Puccinia hieracii* — *Sphaerotheca macularis* var. *fuliginea.*

Tellima grandiflora. — *Puccinia heucherae.*

Tritelia ixioides var. *analina.* — *Heterosporium allii.*

Trifolium involucratum var. *fimbriatum.* — *Polythrincium trifolii.*

Veratrum californicum. — *Botrytis cinerea* — *Cylindrosporium veratrinum* — *Diplodia veratri* — *Hendersonia sp.* — *Humaria scutellata* — *Laetinaevia veratri* — *Mycosphaerella tassiana* — *Pleospora* sp. — *Phyllosticta melanoplaca* — *Puccinia veratri* — *Typhula* sp.

Veronica alpina var. *unalaschensis.* — *Peronospora grisea.*

Vicia americana. — *Erysiphe polygoni* — *Uromyces fabae.*

Viola adunca var. *longi pes.* — *Puccinia violae.*

Viola lobata. — *Puccinia effusa.*

Viola purpurea. — *Phyllosticta nigrescens* — *Sphaerotheca macularis.*

ON FERNS

Athyrium americanum. — *Hysterium magnisporum.* — *Typhula* sp.

Athyrium filix-foemina var. *californicum.* — *Uredinopsis copelandii.*

Cryptogramma acrostichoides. — *Typhula* sp.

Cystopteris fragilis. — *Hyalopsora polypodii.*

Pteridium aquilinum var. *pubescens.* — *Cryptomycina pteridis* — *Gloeosporium pteridis* — *Uredinapsis macrosperma.*

ON FUNGI.

Acanthonitschkia coloradense. — *Dasyscypha acanthonitschkiae.*
Armillaria zelleri. — *Diplocladium majus.*
Fomes pinicola. — *Hypocrea citrina.*
Ganoderma oregonense. — *Hypomyces aurantius.*
Puccinia atrofusca. — *Darluca filum.*
Puccinia rubigo-vera. — *Darluca filum.*
Uromyces fabae. — *Darluca filum.*

ON INSECTS.

Musca sp. — *Entomophthora muscae.*

ON CLOTH.

Cladosporium herbarum. — *Stemphyllium consortiale.*

ON ORGANIC DEBRIS NEAR SUMMIT.

Cladosporium herbarum. — *Mucor* sp. — *Penicillium* sp.

ON HUMUS, DUFF, LITTER.

Agaricus arvensis — *Amanitopsis vaginata* — *Armillaria zelleri* — *Astraeus hygrometricus* — *Astraeus pteridis* — *Boletus albidus* ssp. *eupachypus* — *Boletus frustosus* — *Bovista pila* — *Calodon amicum* — *Calvatia craniiformis* — *Calvatia fumosa* — *Calvatia sculpta* — *Calvatia subcretacea* — *Calbovista subsculpta* — *Cantharellula umbonata* — *Clavaria conjuncta* — *Clavaria obtusissima* — *Clavaria secunda* — *Clavaria subdecurrens* — *Clitocybe* ssp. — *Coltricia perennis* — *Coprinus comatus* — *Cortinarius* (near) *aurifolius* — *Cortinarius cotoneus* — *Cortinarius heterosporus* — *Cortinarius orichalceus* — *Crucibulum laeve* — *Discina ancilis* — *Cyttarophyllum cucullata* — *Cyttarophyllum polytrichoides* — *Geastrum coronatum* — *Helvella californica* — *Helvella caroliniana* — *Hygrophorus gliocyclus* — *Hygrophorus russula* — *Hygrophorus vernalis* — *Laccaria* sp. — *Lamprospora leiocarpa* — *Longula texensis* — *Melanoleuca* sp. — *Montagnea arenarius* — *Mycena alcalina* — *Mycena gracilis* — *Mycena griseoconica* — *Mycena griseoviride* — *Mycena laevigata* — *Naucoria* sp. — *Naematoloma fasciculare* — *Omphalina rustica* — *Caloscypha fulgens* — *Paxina nigrella* — *Pholiota trachyspora* — *Psathyrella atrifolia* — *Psathyrella* sp. — *Rhodophyllus* sp. — *Russula delica* — *Sarcosphaera amplissima* — *Secotium nubigenum* — *Secotium pingue* — *Stropharia sienna* — *Tricholoma rhizoideum* — *Tulostoma tuberculatum* — *Suillus* sp. — *Xerocomus miniato-olivaceus.*

HYPOGAEOUS.

Abstoma reticulatum — *Archangiella lactarioides* — *Archangiella magna* — *Elasmomyces alpinus* — *Elasmomyces echinosporus* — *Endogone lactiflua* — *Endogone* sp. — *Gautieria monticola* — *Gymnoglossum elasmomycetoides* — *Hydnangium parksii* — *Hydnotrya variiformis* — *Hymenogaster remyi* — *Hymenogaster tener* — *Hysterangium darkeri* — *Hysterangium phillipsii* — *Hysterangium separabile* — *Melanogaster tuberiaeformis* — *Melanogaster variegatus* — *Pompholyx occidentalis* — *Rhizopogon brunnescens* — *Rhizopogon exiguus* — *Rhizopogon occidentalis* — *Rhizopogon pannosus* — *Rhizopogon provincialis* — *Rhizopogon rubescens* — *Rhizo-*

pogon separabilis — Sedecula pulvinata — Scleroderma bovista — Scleroderma hypogaeum.

ON DUNG

Patella coprinaria — Rhyparobius monascus — Sordaria bombarioides — Sporormia australis.

ISOLATED FROM SOIL

Aspergillus fumigatus — Cephalosporium sp. *— Chaetomium succineum — Coniothyrium fuckelii — Curvularia inaequalis — Mortierella pusilla — Mucor hiemalis — Penicillium ?notatum — Penicillium lanosum — Penicillium raistrickii — Penicillium* spp. *— Sporotrichum* sp. *— Trichoderma viride — Verticillium terrestre.*

Preliminary Isolations of Soil Fungi.

On Feb. 17, 1947, George Nyland, then in the Dept. of Plant Pathology, The State College of Washington, plated out in replicates of eight in 1 : 10,000 dilutions on malt agar five samples of soil collected on Mount Shasta in the summer of 1946. The writer made the subsequent examination of the plates and found the following fungi:

Date	Source	pH of soil	No. of colonies	Fungi
6-21-46	Forest, 7000 ft.	5.5	2,250,000	*Aspergillus fumigatus* *Coniothyrium fuckelii* *Fusarium* sp. *Mortierella pusilla* *Penicillium ?notatum*
7-16-46	Sedge clumps 10,000 ft.	6.1	3,750,000	*Cladosporium herbarum* *Penicillium ?notatum* *Penicillium* spp. *Streptomyces* sp. *Verticillium terrestre*
8-26-46	Sedge Clumps 9,500 ft.	5.9	1,250,000	*Penicillium ?notatum* *Penicillium* spp. *Verticillium terrestre*
8-26-46	Summit of Shastina 12,335 ft.	5.5	10,000,000	*Mucor hiemalis* *Penicillium ?notatum* *Penicillium* spp. *Trichoderma viride*
8-29-46	Heather meadow 7600 ft.	5.6	900,000	*Aspergillus fumigatus* *Chaetomium succineum* *Curvularia inaequalis* *Penicillium ?notatum* *Penicillium* ssp. *Trichoderma viride*

The number of colonies reported is the approximate number of colonies per gram air dry soil based on the average of eight plates.

pH was determined by a Beckman pH meter. The *Curvularia* was determined by J. Walton Groves, the *Chaetomium* by L. W. Ames, the *Mortierella* and *Mucor* by R. W. Emerson, and the other species by the writer. The following habitat notes are given:

1. In Shasta fir forest along the Horse Camp-Wagon Camp Trail under duff. The soil was associated with the roots of *Allium tribracteatum*. Shasta Fir Zone.

2. Isolated clumps of *Carex breweri* occur near the top of a ridge north of Horse Camp at the upper limits of the White Bark Pine zone. Soil was obtained from around one of these clumps.

3. In the basin at the head of Cascade Gulch between Shasta and Shastina there has been no meadow formed but occasional plants dot the area. Clumps of *Carex breweri* are scattered through this basin and around them is formed the closest approximation of a soil in the area.

4. Sand and graved were obtained from the summit of Shastina. Evidently mold spores are deposited here by winds which continually blow over the mountain. The only growth in the area above 12,000 feet consists of crustose lichens on the rocks. Probably at this elevation frost occurs every night.

5. Panther Creek Meadows was described above. The tested sample came from the lower part of the middle meadow.

Explanation of Species List.

That part of the mountain in the southwest quadrant with its apices between Horse Camp at 8000 feet and the 10,000 foot level on the west bank of Mud Creek Canyon, and with its bases between Mount Shasta, McCloud and Mud Creek Dam, is the area which has been most intensively studied and collected. This will be evident throughout the following notes.

Notes are spotty on the mycological history of Mt. Shasta localities. This is because collections and notes were spotty on the basis that once a species was collected its presence in that locality was established and little more information was desirable. A study of Gilbert (18), however, has convinced the writer of the fallacy of this idea.

It will be noted that it was not possible to be in all localities of all stations in all zones in all of the eight summers the writer has spent at Horse Camp, nor was it possible to visit some localities more than once a year, if that often. However, such locations as the Sisson Southern Trail and the area through which it passes; and the Horse Camp-Wagon Camp Trail, Wagon Camp, Bear Springs, the Wagon Camp Road and McCloud Avenue, were visited frequently during the period he was on the mountain.

The frequency of observation of the species is partially indicated by collection numbers. This, then, is incomplete since over-abundant collecting would overburden the herbarium facilities of both the writer and his exchange correspondents. The frequency of occurrence of individuals is roughly indicated in only a few cases.

The dates of collection of the species are listed here in an attempt to partially establish the phenology of the species. Phenology will vary for each species as the dates of the season vary with the intensity of the snow pack. While complete phenologic data are available for certain individual collections not enough collections of a species are available over a period of time in the same season in the same locality for a complete presentation of this point for each species. The phenology of the species goes beyond the collection of merely mature material, but where available notes will be given.

Constancy of species is indicated only by the series of years listed under the dates of collection. These data are not complete since all species were not collected in all years although in many cases fruit bodies were present.

Data concerning abundance will be given with each species based on the following indices:

I. Very abundant.
II. Abundant.
III. Common.
IV. Rare.
V. Very rare.

These indices in roman numerals will be supplemented by a series of indices in letters. One or more combinations of the above numerals and the letters listed below will appear with each species.

A. On coniferous, woody, substrata.
B. On broadleaf, woody, substrata.
C. On herbaceous substrata.
D. On humus, duff or litter.
E. On animals and insects.
F. On other fungi.

If adventitious species exist on the mountain it is as a result of reaching the area with an adventitious host as in the case of ***Albugo candida*** on ***Sisymbrium altissimum***. Wind blown spores, or spores carried by other means, may not necessarily produce adventitious species if a species can become established at a certain station. This observation, of course, is based on the hypothesis that all species adaptable to a certain set of environmental conditions can eventually be found in many, if not all, of the stations with these conditions. The presence of ***Cladosporium herbarum*** on fabric at the summit of the moutain, and of this species as well as at least one species each of ***Penicillium***, ***Mucor*** and an unidentified fungus on a discarded

hamburger sandwich at the three mile post on the Summit Trail at 13,000 feet, may indicate the presence of adventitious species for it is not certain that these fungi survive throughout the year at these elevations where freezing temperatures probably occur throughout part of each day of the year.

Specific geographic distribution will be considered in connection with only a few of the species listed. Most distributions will be indicated in a general or an incomplete manner since Saccardo's Sylloge Fungorum and most monographs consulted for this information list it in a general manner rather than in specific terms.

Further information is added for most species. At the suggestion of R. F. Daubenmire, the dominant vascular plants associated with the collections are listed.

Most of the collections cited prior to 1946 were made by the writer; most of those made between 1946 and 1950 by the writer and his wife, Vivian G. Cooke; and in 1951 by these two and their nephew Ronald E. Binegar. Collections made by others are noted where they have come to our attention through herbarium specimens or isolated literature reference. It is possible that additional collections not cited here may be found in herbaria not yet studied by the writer.

Specimens distributed in the writer's exsiccatum "Mycobiota of North America" will be indicated: "Exs. 1". This series is now distributed to twentyfive herbaria in North America, Europe and India.

In the case of molds of overwintering herbage, of certain grass leaf diseases and of certain wood inhabiting fungi, especially in the following genera, no record was kept in the writer's notebooks (1937—1941) of the determinations made. Thus no specific data on the frequency of occurrence, seasons and collections are presented for collections of these genera made prior to 1946. These genera include: *Aposphaeria, Cladosporium, Dendryphium, Hendersonia, Heteropatella, Leptosphaeria, Lophium, Mycosphaerella, Oidium, Pellicularia, Phoma, Pleospora, Pyrenophora, Rhynchostoma, Scelobelonium, Scolecotrichum, Sepedonium, Septoriella, Sphaeridium, Sphaeropsis, Stemphyllium, Tilachlidium* and *Titaea.* In the indicated years species of the genera were found in one or more of the indicated number of collections: 1937: 25; 1938: 12; 1939: 10; 1940: 17; 1941: 15.

A complete series of species (expect hypogaeous ones) in many of the cited numbers is on file at the Herbarium of the University of California. Partial sets are filed at the Herbarium of the University of Cincinnati; the Mycological Collections, Bureau of Plant Industry, Beltsville, Maryland; the Herbarium of Oregon State College; the Farlow Herbarium, and the Herbarium of the New York Botanical Garden. All collections of *Gasteromycetes* examined by S. M. Zeller prior

to his death are in his herbarium now at the New York Botanical Garden. Duplicates studied by various authorities are in the herbaria of the various institutions with which they are associated.

Among mycologists who have assisted in identifying the following species are: L. W. Ames, Lee Bonar, Edith K. Cash, Maxwell S. Doty, R. W. Emerson, G. W. Fischer, H. M. Gilkey, J. Walton Growes, A. E. Jenkins, B. B. Kanouse. D. H. Linder, G. W. Martin, J. H. Miller, L. W. Miller, A. J. Mix, L. O. Overholts, D. P. Rogers, Ruth Remsberg, F. J. Seaver, A. H. Smith, Rolf Singer, Roderick Sprague, J. A. Stevenson, L. E. Wehmeyer, S. M. Zeller, G. L. Zundel. In addition, E. Garton Linsley, Division of Entomology and Parasitology, University of California, identified the beetle *Dacne picea*.

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Systematik List of the Fungi of Mt. Shasta.

I. Myxomycetes.

A report on 127 collections of 47 species has been published separately (Cooke, 12).

II. Phycomycetes.

A. *Oomycetes.*

1. *Chytridiales.*

a) *Synchytriaceae.*

Synchytrium asari Arth. & Holw. — On *Asarum hartwegii.* — 5000—5500 feet, Sierra Mixed Conifer zone. Collections: 13329, 14661, 20239, 20350, Exs. 71. Dates: 14 July 1939; 19 July 1940; 10, 25 Julz 1947. Abundance III, C. Associates: *Pinus ponderosa, Abies concolor, Ceanothus velutinus, Castanopsis chrysophylla.* Distribution: On at least three species of *Asarum* in Minnesota, Wisconsin, California; Mt. Shasta.

Synchytrium aureum Schroet. — On *Ligusticum grayi.* Below the rush swale, Squaw Valley Creek meadows, 7500 ft. Abundance: V, C. — Collected once. Associates: *Phyllodoce empetriformis, Kalmia polifolia, Tsuga mertensiana.* Distribution: On about 100 hosts in Europe and North America; Mt. Shasta.

Saprolegniales.

Saprolegniaceae.

Saprolegnia sp. — At the Shasta Alpine Lodge the cooling system during 1936—1941 and in 1946 and 1947 consisted of a series

of three tubs into the upper of which a continuous stream of water from the water supply spring was directed. The first tub, used for drinking and cooking, overflowed into the second, used for a cooler for submerged foods and floating vegetables, which in turn overflowed into the third, used for washing hands. This flowed into a small creek which runs for a couple of hundred feet before percolating and which irrigated about a hundred square feet of sod. In the second tub vegetables were kept fresh for from one to three weeks. After 6—10 days in cracks of tomato skins or over the surface of Italian squash, a saprolegniaceous fungus produced a luxurient growth which, if allowed to grow for three weeks, would completely cover the concerned vegetable with a dense mass of white mycelium. No adequate way has been found as yet to get the fungus to a competent authority for identification. Possibly more than one species is involved. Probably this species, and others, could be obtained from similar situations in other mountainous regions.

Peronosporales.

Albuginaceae.

Albugo candida (Pers.) Roussel. — On *Sisymbrium altissimum.* — With the host following the Shasta Snowline Highway up to MacBride Springs, 4000—5000 feet. See Cooke (11).
Collections: 15507, 15600, 15652, 20085, Exs. 121. Dates: 11 June, 25, 31 July 1941; 27 June 1947; seen in other years. Abundance: III, C. Associates: *Arctostaphylos patula, Ceanothus velutinus.* Distribution: On more than 70 cruciferous hosts in North and South America, Europe, Asia and Africa; Mt. Shasta.

Peronosporaceae.

Peronospora grisea (Ung.) d. By. — On *Veronica alpina* var. *unalaschensis.* — Sierra Mixed Conifer Zone, Wagon Camp, 5700 ft.
Collection: 20327; Date: 18 July 1947; Abundance: V, C. Associates: *Mimulus, Epilobium, Veratrum, Allium, Habenaria.*

Zygomycetes.

Mucorales.

A number of molds attack foods kept for more than three or four days without frequent boiling. This occurs usually during the warm weeks in late July and in August. No attempt has been made to isolate and identify these.

Mucoraceae.

Mucor hiemalis Wehmer. — Isolated from soil, summit of Shastina, 12,335 ft. Date: 26. Aug. 1946, isolated 17 Feb. 1947. Associates: *Penicillium* spp., crustose lichens on rocks. Distribution: Europe, Greenland, Canada, six states in the United States, Mt. Shasta.

Mortierellaaceae.

Mortierella pusilla Oud. — Isolated from soil, Shasta fir woods, 7000 ft. Date: 21 June 1946, isolated 17 Feb. 1947. Associates: *Allium tribracteatum, Abies magnifica* var. *shastensis.* Distribution: Europe, Canada, Mt. Shasta.

Endogonaceae.

Endogone lactiflua Berk. — *Endogone* sp. — Hypogaeous, Shasta Fir zone near Horse Camp, 8000 ft.
Collections: *E. lactiflua*: 13295; *E.* sp.: 13294, 13303. Dates: *E. lactiflua*: 28 June 1939; *E.* sp.: 28 June, 5 July 1939. Abundance: IV, D. Associates: *Abies magnifica* var. *shastensis.* Distribution: *E. lactiflua:* Europe, New England, California; Mt. Shasta.

Entomophthorales.

Entomophthoraceae.

Entomophthora muscae (Cohn) Fres. — Found once on dead flies on a window, Shasta Alpine Lodge, Horse Camp, 8000 ft. Collection: 7612; Date: 1 Sept. 1936; Abundance: V, E. Distribution: North America, Europe, Greenland.

Ascomycetes.

Hemiascomycetes.

Exoascales.

Exoascaceae.

Taphrina castanopsidis Ell. & Ev. ex Jenkins. — On *Castanopsis chrysophylla.* — Although the Sisson Southern Trail was in constant use by the writer from 1936 to 1941 this fungus was not observed during the intervening years. It was collected once in 1936 and was found to be abundant in 1941. Again in 1947 it was common around the base of the mountain. In the chaparral and on scattered shrubs up to 6000 feet.
Collections: 8610, 15654, 15724, 20229, 20302, 20351, 20401, Exs. 139. M. A. Howe, July 1894. Dates: July 1894; 30 July 1936; 31 July, 18. Aug. 1941; 10, 17, 25 July, 8. Aug. 1947. The 1936 collection consisted of 10 leaves. In 1941 one collection consisted of 303 leaves from several shrubs in one colony. These shrubs are evergreen, retaining their healthy leaves for several years. Abundance: II, B. Associates: *Arctostaphylos patula, Ceanothus velutinus.* Distribution: Calaveras Co.; Mt. Shasta, Siskiyou Co., Calif.

Taphrina confusa (Atk.) Gies. — On *Prunus demisa.* — Scattered colonies of this diciduous shrub in the chaparral are occasionally infected by this fungus which causes witches brooms on which the leaves are curled. These brooms may produce healthy leaves in subsequent years. Shasta Snowline Highway and old snowline road, 4500 feet.

Collections: 15506, 16638. Dates: 7 June 1941, 29 May 1942. Abundance: III, B. Associates: *Arctostaphylos patula, Ceanothus velutinus, Castanopsis chrysophylla.* Distribution: North America; Mt. Shasta.

Taphrina flectens Mix. — On *Prunus emarginata.* — On the mountain this species is occasional on locally abundant shrubs in the chaparral. It forms small to large witches brooms.
Collections: 10212, 10282, 13252, 13255, 13323, Exs. 25. Dates: 15 July, 22. Aug. 1938; 16 June, 7 July 1939. Frequently observed in 1940, 1941, 1942, 1946 and 1947. Abundance: II, B. Associates: *Arctostaphylos patula, Ceanothus velutinus, Castanopsis chrysophylla.* Distribution: Western North America; Mt. Shasta.

Taphrina potentillae (Farl.) Johans. — On *Potentilla glandulosa* ssp. *nevadensis.* — Near a spring and along a dry creek above Wagon Camp, Shasta Fir zone; MacBride Springs, Sierra Mixed Conifer zone. Infection mild but all leaves on a plant may be infected.
Collections: 8581, 14626, 15587, 20331, Exs. 115, 115-A. Dates: 16 July 1937, 5 July 1940, 18 July 1941, 18 July 1947. Abundance: IV, C. Associates: *Abies magnifica* var. *shastensis; Libocedrus decurrens. Pinus ponderosa.*

On *Potentilla flabellifolia.* — A few leaves on one plant infected. South Gate springs, 8250 feet, White Bark Pine zone.
Collections: 20282. Date: 10 July 1947. Abundance V, C. Associates: *Carex spectabilis, Lutkea pectinata, Mimulus tilingii.* Distribution: On several species of *Potentilla* in Scandinavia, Great Britain, North America; Mt. Shasta.

Taphrina pruni-subcordatae (Zeller) Mix. — On *Prunus subcordata.* — Collected on shrubs along the old snowline road below MacBride Springs where a colony is occasionally attacked. in 1946 large witches brooms were formed on which all leaves were deformed. In 1947 there was no sign of diseased material on shoots from these brooms.
Collections: 14724, 18117, Exs. 72. Dates: 15 Sept. 1940, 26 June 1946. Abundance: III, B. Associates: *Arctostaphylos patula, Ceanothus velutinus, Castanopsis chrysophylla.* Distribution: Oregon, California; Mt. Shasta.

Euascomycetes.

Plectomycetes.

Eurotiales.

Eurotiaceae.

Aspergillus fumigatus Fres. — Isolated from soil from Shasta Fir forest and from Panther Creek Meadows, Shasta Fir zone, 7000 and 7600 feet.
Dates: 21 June, 29. Aug. 1946. Isolated 17 Feb. 1947. Associates: *Abies magnifica* var. *shastensis; Phyllodoce empetriformis, Kalmia poli-*

folia. Distribution: Europe, North and South America; Mt. Shasta.

Penicillium spp. (including *P. ?notatum*). — Isolated from the soils indicated in the table.

Penicillium lanosum Westling. — Isolated from soil collected at Wagon Camp in 1948.

Penicillium raciborskii Zaleski. — Isolated from soil collected at Wagon Camp in 1948.

Erysiphales.
Erysiphaceae.

Erysiphe cichoracearum DC. ex Méral. — On *Cryptantha affinis.* — A small host colony was infected near Wagon Camp.
Collections: 8617. Date: 6 Aug. 1937. Abundance: IV, C. Associates: *Abies concolor, Abies magnifica* var. *shastensis.*

On *Erigeron inornatus.* — Observed annually throughout the range of the host below MacBride Springs and Bear Springs in the chaparral.
Collections: 13380, 20390, Exs. 19. Dates: 4. Aug. 1939, 1 Aug. 1947. Abundance: II, C. Associates: *Arctostaphylos patula, Ceanothus velutinus.*

On *Phacelia mutabilis.* — Near Wagon Camp.
Collections: 20423. Date: 15 Aug. 1947. Abundance: IV, C. Associates: *Prunus emarginata, Ceanothus velutinus.* Distribution: Cosmopolitan.

Erysiphe graminis DC. ex Mérat. — On *Agrostis exarata.* — Causing a mild infection in the Bear Springs area.
Collection: 13331, Exs. 20. Date: 7 July 1939. Abundance: V, C. Associates: *Libocedrus decurrens, Pinus jeffreyi.*

On *Poa pratensis.* — Causing a mild infection at Horse Camp.
Collections: 10214, 13398, 18433, Exs. 26. Dates: 15 July 1938, 20. Aug. 1939, 2. Sept. 1946. Abundance: II, C. Associates: *Abies magnifica* var. *shastensis.*

On *Elymus elymoides.* — Causing a fairly heavy infection on some plants in the vicinity of Horse Camp.
Collections: 13397, 18432, Exs. 27. Dates: 20 Aug. 1939, 4. Sept. 1946. Abundance: III, C. Associates: *Abies magnifica* var. *shastensis.* Distribution: Cosmopolitan.

Erysiphe polygoni DC. ex Mérat. — On *Eriogonum marifolium.* — Infection rare on this common host. At 7500 ft., below Horse Camp.
Collections: 13360, 20398. Dates: 26 July 1939, 8 Aug. 1947. Abundance: V, C. Associates: *Abies magnifica* var. *shastensis.*

On *Arabis platysperma.* — Complete infection on one host colony along the Sisson Southern Trail in Shasta Fir woods at 7000 feet.
Collection: 20470, Exs. 251. Date: 22 Aug. 1947. Abundance: III, C. Associates: *Abies magnifica* var. *shastensis.*

On *Vicia americana.* — Usually common in dryer portions of Wagon Camp Meadows and MacBride Springs areas.
Collection: 13346, Exs. 21. Date: 21 July 1939. Abundance: I, C. Associates: *Arctostaphylos patula, Ceanothus velutinus.* Distribution: Cosmopolitan.

Sphaerotheca epilobii (Lk.) Duby. — Common on plants around springs. Wagon Camp and Sisson Southern Trail Springs.
Collections: 8616, 20410. Dates: 6 Aug. 1937, 8 Aug. 1947. Abundance: IV, C. Associates: *Abies concolor, Abies magnifica* var. *shastensis, Veratrum californicum.*

On *Epilobium lactiflorum.* — Covering a host colony near a sping along Squaw Valley Creek, 8000 ft.
Collection: 13316, Exs. 21. Date: 24 Aug. 1939. Abundance: V, C. Associates: *Tsuga mertensiana, Abies magnifica* var. *shastensis.* Distribution: On more than seven species of *Epilobium* in Europe; Mt. Shasta.

Sphaerotheca macularis (Wallr. ex Fr.) W. B. Cke. — On *Viola purpurea.* — A large host colony along trail above Wagon Camp was heavily infected.
Collections: 10288, 13403, Exs. 22. Dates: 8 Sept. 1938, 22 Aug. 1939. Abundance: IV, C. Associates: *Abies magnifica* var. *shastensis.* Distribution: Cosmopolitan.

Sphaerotheca macularis var. *fuliginea* (Schlecht. ex Fr.) W. B. Cke. — On *Arnica mollis.* — While the host is common at Panther Creek and Squaw Valley Creek meadows infection has been observed only at the latter location.
Collections: 10298, 13415, Exs. 23. Dates: 8 Sept. 1938, 24. Aug. 1939. Abundance: II, C. Associates: *Tsuga mertensiana, Abies magnifica* var. *shastensis.*

On *Taraxacum officinale.* — Observed on only several plants at Wagon Camp.
Collection: 20428. Date: 15. Aug. 1947. Abundance: V, C. Associates: Herbaceous plants of Wagon Camp meadows. Distribution: On more than eleven host genera, wide spread.

Perisporiaceae.

Dimerium alpinum W. B. Cke. — On *Pentstemon menziesii* var. *davidsonii.*

The host normally inhabits exposed places in the timberline region and in the White Bark Pine zone where it finds shelter on the moist side of rocks and moisture near seepage areas. While it occurs in other locations of a more exposed nature, in this type of location whole colonies become blackened with the fungus. These habitats are subject to prolonged periods of cover by the annual snow pack. At these times the relative humidity is very high although the

temperatures are low. These conditions are reversed in the summer with the high insolation characteristic of higher elevations with little or no shade from forest cover. Observed throughout the southwest quadrant between 8500 and 9500 feet.
Collections: 8601, 10252, 15711, 18314 (type), 20479, 28301. Dates: 28 July 1937, 28 July 1938, 14. Aug. 1941, 30 July 1946, 28 Aug. 1947, 2 July 1951. Abundance: III, B. Associates: *Eriogonum marifolium.* Distribution: Known only from these collections; British Columbia.

Pyrenomycetes.
Sphaeriales.

Sordariaceae.

Sordaria bombarioides Awd. — On horse dung.

A specimen collected by Harkness at Mt. Shasta, Calif., was cited by Griffiths in "North American Sordariaceae", Mem. Torr. Bot. Cl. **11**: 43. 1901. This must have been obtained on the mountain for the name of the community at its base was not changed from Sisson's to Mount Shasta until 1925.

On deer dung. — Shasta Fir woods on ridge between Horse Camp and Panther Creek Meadows.
Collection: 28295. Date: 2 July 1951. Abundance: IV. Associate: *Abies magnifica* var. *shastensis.* Distribution: Widespread.

Sporormia australis Speg. — On deer dung. — Shasta fir forest on ridge between Horse Camp and Panther Creek Meadows.
Collection: 28296. Date: 2 July 1951. Abundance: IV. Associate: *Abies magnifica* var. *shastensis.* Distribution: Argentina, Ontario, Mt. Shasta.

Chaetomiaceae.

Chaetomium murorum Corda. — Isolated by G. W. Martin from piece of wood of Shasta fir sent for study of Myxomycete plasmodium. Horse Camp, 8000 ft.
Date: Sept. 1941. Isolated after incubation in moist chamber 7 Dec. 1945, G.W.M. 6259. Det. J. W. Groves. Abundance: V, A. Associates: *Abies magnifica* var. *shastensis.* Distribution: Europe, Mt., Shasta.

Chaetomium succineum Ames and *Chaetomium* sp. — Isolated from soil from Panther Creek Meadows.
Date: 29 Aug. 1946. Isolated 17 Feb. 1947. Distribution: *C. succineum*; Known only from this collection.

Diaporthaceae.

Cryptosporella acerina L. E. Wehmeyer. — On *Acer glabrum.* — A few branches of shrubs below the Sisson Southern Trail Spring were infected.
Collection: 20413 (type). Date: 8 Aug. 1947. Abundance: IV, B. Associates: *Abies concolor, Abies magnifica* var. *shastensis, Pinus pon-*

derosa, Pinus lambertiana. Distribution: Known only from this collection.

Xylariaceae.

Hypoxylon diathrauston Rehm. — (*Creosphaeria pinea* Petrak). — On *Abies concolor.* — On bark of twigs and branches of fallen tree along the Sisson Southern Trail at 6500 feet.
Collection: 20179, Exs. 255. Date: 27 June 1947. Abundance: IV, A. Associates: *Abies concolor.* Distribution: Tyrol, Austria; Mt. Shasta.

Hypoxylon serpens Pers. ex Fr. — On *Ceanothus velutinus.* — Common on dead branches wherever the host is smothered out by young colonies of *Abies concolor* and *Pinus ponderosa.*
Collections: 18100, Exs. 211. Date: 28 June 1946. Abundance III, B. Associates: *Abies concolor, Pinus ponderosa.* Distribution: Europe, Siberia, Borneo, North and South America; Mt. Shasta.

Rosellinia riminicola Rehm. — On *Haplopappus bloomeri* var. *angustatus.* — Common on dead branches in the Horse Camp area, 8000 ft.
Collections: 18083, 18177, Exs. 212. Dates: 27 June, 7 July 1946. Abundance: III, B. Associates: *Arctostaphylos nevadensis, Abies magnifica* var. *shastensis.* Distribution: Europe, Mt. Shasta.

Rosellinia subsimilis Sacc. — On *Arctostaphylos nevadensis.* — Occasional branches carry fruit bodies, Horse Camp, 8000 ft.
Collection: 18184. Date: 8 July 1946. Abundance: IV, B. Associate: *Abies magnifica* var. *shastensis.*

On *Arctostaphylos patula.* — Covering dead branches in the chaparral along the lower end of the Sisson Southern Trail, 4500 ft.
Collection: 19296, Exs. 256. Date: 7 April 1947. Abundance: IV, B. Associates: *Ceanothus velutinus, Castanopsis chrysophylla.* Distribution: Finland, Mt. Shasta.

Hypocreales.

Hypocreaceae.

Hypomyces aurantius (Pers.) Fckl. — On *Ganoderma oregonense.* — Large conks of the host fungus have been found in the season following their emergence in somewhat disintegrated conditon. The hymenial surface of some of these conks was covered with this disease. Beetles which eat the *Canoderma* seem to leave the *Hypomyces* to some other agent of decay.
Collections: 10127, 20058, 20296. Dates: 20 June 1938; 22 June, 16 July 1947. Abundance: IV, F. Associates: *Abies magnifica* var. *shastensis.* Distribution: Europe, Cuba, North America; Mt. Shasta.

Specimens of *Spongiporus leucospongia* collected on an old White Bark Pine sign post high above timberline along the Summit Trail had turned a color characteristic of the early stages of this

fungus. However, it had not fruited and no attempt was made to culture it.

Hypocrea citrina (Pers.) Fr. — On *Fomes pinicola.* — Occasional conks of the host occurring on Shasta fir are infected with small colonies of this fungus. Panther Creek Meadows, 7600 ft. Collection: 28258. Date: 1 July 1951. Abundance: V, F. Associates: *Abies magnifica* var. *shastensis, Tsuga mertensiana.* Distribution: Ceylon, Tasmania, Europe, North America; Mt. Shasta.

Lophiostomatales.

Lophiostomataceae.

Lophiastoma brenckleanum Sacc. — On *Haplopappus bloomeri* var. *angustatus.* — Found once at Horse Camp, 8000 ft. Collection: 18181. Date: 8 July 1946. Abundance: V, B. Associates: *Abies magnifica* var. *shastensis.* Distribution: North Dakota; Mt. Shasta.

Microthyriaceae.

Microthyrium microscopicum Desm. — On *Arabis platysperma.* — On dead stems of previous year, south side of Red Butte, 8000 ft.

Collection: 25584. Date: 24 Aug. 1949. Abundance: V, B. Associates: *Tsuga mertensiana, Abies magnifica* var. *shastensis.* Distribution: New Zealand, Europe, North America; Mt. Shasta.

Dothideales.

Dothideaceae.

Dothidella janus (Berk. & Curt.) Hoehn. — On *Castanopsis chrysophylla.* — Occasional throughout the range of the host, but occasionally abundant on single branches or on a colony of shrubs. Collections: 8510, 10114, 10236, 16635, Exs. 28, 28, 28—A, 25698. Dates: 26 June 1937; 17 June, 22 July 1938; 30 May 1942; 26. Aug. 1949. Abundance: I, B. Associates: *Arctostaphylos patula, Ceanothus velutinus.* Distribution: California, Oregon, Washington, New Mexico, Texas, Florida, Mt. Shasta.

Dothidella junci (Fr.) Sacc. — On *Juncus parryi.* — Ascostromata found on most of the culms of occasional clumps in the vicinity of Horse Camp.

Collections: 10303, 18032, Exs. 40—A. Dates: 17 Sept. 1938, 24 June 1946. Abundance: IV, C. Associate: *Abies magnifica* var. *shastensis.* Distribution: Europe, California; Mt. Shasta.

Dothidella trifolii (Pers. ex Fr.) Bayl.-Ell. & Stan. — On *Trifolium involucratum* var. *fimbriatum.* — The imperfect stage, *Polythrincium trifolii,* was found once on the host which is widespread in Bear Springs meadow.

Collection: 14694, Exs. 74. Date: 2 Aug. 1940. Abundance: IV, C. Associates: *Lotus obtusifolius* var. *torreyi* and other herbs. Distribution: On more than 11 species of *Trifolium* in Europe, Siberia, North America, Mt. Shasta.

Stigmatea sequoiae (Cke. & Harkn.) Ell. & Ev. — On *Libocedrus decurrens.* — Reported on drying leaves at Sisson (now Mount Shasta), Aug. 1894, by W. C. Blasdale. N. Am. Fung. 3222. Fung. Col. 719.

Mycosphaerellaceae.

Mycosphaerella aquilegiae Ell. & Galw. — On *Lupinus obtusilobus.* — Abundance: V, C. Distribution: Europe, Mt. Shasta.

Mycosphaerella schoenoprasi (Awd.) Wehm. — On *Allium validum.* — On overwintered herbage, Panther Creek Meadows.

Collection: 20453. Date: 15 Aug. 1947. Abundance IV, C. Associates: Streamside herbs including *Mimulus, Arnica,* etc. Distribution: Europe, Wyoming, Mt. Shasta.

Mycosphaerella tassiana (Not.) Johans. — On *Allium validum.* — On overwintered herbage around springs above Wagon Camp, 6200 ft.

Collection: 18008. Date: 21 June 1946. Abundance: V, C. Associates: *Arnica* and other spring stream herbs.

On *Arabis platysperma.* — On overwintered stems, Sisson Southern Trail, 7000 ft.

Collection: 20480. Date: 15 Aug. 1947. Abundance: V, C. Associates: *Abies magnifica* var. *shastensis.*

On *Carex fracta.* — With *Cladosporium herbarum* on overwintered leaves, MacBride Springs.

Collection: 19289. Date: 7 April 1947. Abundance: IV, C. Associates: *Libocedrus decurrens, Rubus parviflorus.*

On *Phleum alpinum.* — On overwintered herbage around springs above Panther Creek Meadows.

Collection: 18405. Date: 27 Aug. 1946. Abundance: V, C. Associates: *Carex spectabilis, Juncus* spp., *Hieracium gracile.*

On *Senecio triangularis.* — On overwintered herbage, lower Panther Creek Meadows.

Collections: 25643. Date: 25 Aug. 1949. Abundance: IV, C. Associates: Streamside vegetation.

On *Veratrum californicum.* — On overwintered stems along lower Panther Creek.

Collection: 25640. Date: 25 Aug. 1949. Abundance: IV, C. Associates: streamside vegetation. Distribution: On al least 51 monocot and 58 dicot hosts, panarctic.

Mycosphaerella tulasnei Jacz. — On *Juncus balticus* var. *montanus*. — On *Trisetum spicatum*. — Abundance: IV, C. Distribution: Europe, North America, Mt. Shasta.

Mycosphaerella sp. — On *Pinus albicaulis*. — On cone scales on ridge above Horse Camp, 9000 feet.
Collection: 18254. Date: 16 July 1946. Abundance: V, A.

Pseudosphaeriales.

Pseudosphaeriaceae.

Acanthonitschkia coloradense Cash & Davidson. — On *Abies magnifica* var. *shastensis*. — On *Pinus ponderosa* boards. — Found on both substrata in the Horse Camp area, 8000 ft. Fir branches on which this grew were recent falls. The unpainted boards had been in use for about 8 years.
Collections: 18201, 18348, 18369. Dates: 10 July, 10, 17 Aug. 1946. Abundance: III, A. Associates: *Abies magnifica* var. *shastensis*. Distribution: Colorado, Mt. Shasta.

Apiosporella alpina Wehm. — On *Arnica longifolia* ssp. *myriadenia*. — Lower end of the Panther Creek meadow area, 6500 ft.
Collection: 20445. Date: 15 Aug. 1947. Abundance: IV, C. Associates: *Allium validum, Arnica mollis*. Distribution: Wyoming, Mt. Shasta.

Apiosporella mimuli Wehm. — On *Allium validum*. — Lower portion of Panther Creek Meadows, 7000 ft.
Collection: 20451. Date: 15 Aug. 1947. Abundance: V, C. Associates: *Arnica* spp., streamside herbs. Distribution: Wyoming, Mt. Shasta.

Apiosporella sp. — On *Lupinus albicaulis* var. *shastensis*. — Common on overwintered herbage, Horse Camp-Wagon Camp Trail, 7000 ft.
Collection: 18007. Date: 21 June 1946. Abundance: III, D. Associate: *Abies magnifica* var. *shastensis*.

Bertia moriformis (Tode ex Fr.) de Not. — On *Abies magnifica* var. *shastensis*. — On exfoliating bark of dead branches, Sisson Southern Trail, 7500 ft.
Collection: 15595, Exs. 118. Date: 23 July 1941. Abundance: IV, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, Java, Siberia, North America, Mt. Shasta.

Dibotryon morbosum (Lib.) Theiss. & Syd. — On *Prunus demisa*. — Only one colony has been observed to be infected, in the chaparral, old snowline road, 4500 ft.
Collection: 18115, Exs. 210. Date: 28 June 1946. Abundance: IV, B. Associates: *Arctostaphylos patula, Ceanothus velutinus*. Distribution: North America, Mt. Shasta.

Clathrospora cookei Wehmeyer. — On *Stipa californica*, — On overwintered culms and leaves, Horse Camp.

Collection: 18095 (type). Date: 27 June 1946. Abundance: IV, C. Associate: *Abies magnifica* var. *shastensis*. Distribution: Mt. Shasta, Mt. Rainier.

Clathrospora diplospora (Ell. & Ev.) Wehm. — On *Anemone occidentalis, Castilleja miniata, Monardella odoratissima.* — Scattered through the White Bark Pine zone above 8500 ft. above the basin of Panther Creek Meadows, and around Horse Camp at 8000 ft. in the Shasta Fir zone.
Collections: 18094, 20284, 20285. Dates: 27 June 1946, 10 July 1947. Abundance: III, C. Associates: *Pinus albicaulis, Abies magnifica* var. *shastensis*. Distribution: Kansas, Mt. Shasta.

Gibbera sp. — On *Abies magnifica* var. *shastensis*. — On branches near Horse Camp associated with a pink mold.
Collection: 18333. Date: 31 July 1946. Abundance: V, A. Associate: *Abies magnifica* var. *shastensis*.

Herpotrichia nigra Hart. — On *Abies concolor, Abies magnifica* var. *shastensis, Juniperus communis* var. *montanus, Tsuga mertensiana*.

This fungus commonly occurs on young trees of Shasta fir and mountain hemlock where those threes grow outside of or above the taller timber, in such places as at the edge of economic timberline and avalanche areas which are becoming reseeded. It is a "smothering" fungus and as such is of economic importance since it kills the branches on which it grows. It also occurs on needles in the Shasta fir litter. It has also been found enveloping branches of the shrub juniper which lie near the ground on outcroppings in the White Bark Pine zone. In occasional pockets on lava slopes in the Squaw Valley Creek area occasional trees of White Fir are heavily attacked; Sierra Mixed Conifer zone. Its habitat is in the region of heaviest and longest snow packs.
Collections: on Shasta fir: 10137, 10299, 18044, 18354; on mountain hemlock: 15758; on juniper: 18249, 18409; on white fir: 20234. Dates: 20 June, 10 Sept. 1938; 28 Aug. 1941; 24 June, 16 July, 10, 29 Aug. 1946; 10 July 1947. Also observed throughout the season in each year between 1936 and 1942 and in 1946 and 1947. Abundance: III, A. Associates: All conifer species. Distribution: Iceland, Greenland, Swedish Lappland, Sweden, Norway, Europe, North America, Mt. Shasta.

Lasiosphaeria vermicularia (Nees) Cke. — Collected once in 1937 on Shasta fir slash, Horse Camp.
Abundance: V, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, Carolina, California, Mt. Shasta.

Leptosphaeria doliolum (Pers.) Cel. & de Not. — On *Arnica viscosa*. — Found once at Horse Camp, 8000 ft.

Abundance: IV, C. Associates: *Eriogonum marifolium, Polygonum shastense.* Distribution: On 15 dicots in Europe, Carolina, Mt. Shasta.

Leptosphaeria heterospora (Not.) Niessl. — On *Arnica viscosa, Poa epilis, Stipa occidentalis, Trisetum spicatum.* — On overwintered herbage in the Horse Camp basin area between 8000 and 9500 feet.

Collections: 18095, 20219, 20223, 20477. Dates: 27 June 1946; 2 July, 28 Aug. 1947. Abundance: III, C. Associates: Plants of timberline and White Bark Pine zone. Distribution: Europe, Mt. Shasta.

Leptosphaeria maculans (Desm.) Ces. & de Not. — (*L. sowerbyi* (Fckl.) Sacc.; near *L. galeobdolonis* Feltg.) — On *Lupinus albicaulis* var. *shastensis.* — Covering and blackening entire stems and branches, ridge south of Horse Camp, 8000 ft.

Collection: 2294, Exs. 253. Date: 16 July 1947. Abundance: IV, C. Associates: *Abies magnifica* var. *shastensis.* Distribution: Europe, Mt. Shasta.

Leptosphaeria michotii (West.) Sacc. — On *Juncus orthophyllus.* — Near Horse Camp Springs, 8250 ft.

Abundance: V, C. Associates: *Mimulus tilingii, Juncus mertensianus.* Distribution: On one each of a grass, sedge and rush, Europe; Mt. Shasta.

Leptosphaeria microscopica Karst. — On *Agrostis thurberiana, Trisetum spicatum.* — In the Horse Camp area, 8000—8250 ft.

Abundance: IV, C. Associates: *Mimulus tilingii, Juncus* spp. Distribution: On six grasses in northern Europe; Mt. Shasta.

Leptosphaeria millefolii Fckl. — On *Lupinus obtusilobus.* — Forming blackened areas over entire stems and plants in the Horse Camp area, 8000 ft. During the first year of growth of this fungus it remains sterile on the living host.

Collection: 18199, Exs. 225. Date: 10 July 1946. Abundance: V, C. Associate: *Abies magnifica* var. *shastensis.* Distribution: Central Europe; Mt. Shasta.

Leptosphaeria ?planiuscula (Reiss.) Ces. & de Not. — On *Lupinus albicaulis* var. *shastensis* — On overwintering herbage along the Horse Camp-Wagon Camp Trail, 7000 ft.

Collection: 18007. Date: 21 June 1946. Abundance: IV, C. Associate: *Abies magnifica* var. *shastensis.* Distribution: Germany, Switzerland, Finland; Mt. Shasta.

Leptosphaeria typharum (Desm.) Karst. — On *Phleum alpinum.* — On overwintered culms and leaves at a small spring above Panther Creek meadows, 8500 feet.

Collection: 18405. Date: 29 Aug. 1946. Abundance: IV, C. Associates: *Mimulus tilingii, Carex* spp., *Juncus* spp. Distribution: Europe, Mt. Shasta.

Leptosphaeria vagans Karst. — (*L. caricinella* Karst.; *L. junciseda* Karst.) — On *Agrostis* sp., *Carex* sp., *Juncus balticus* var. *montanus, Juncus orthophyllus, Phleum alpinum, Trisetum spicatum.* — On overwintered herbage in spring areas in the upper Shasta fir zone, timberline areas and White Bark Pine zone.
Collections: More than 10 collections, Exs. 68. Abundance: III, C. Associates: Herbs of springs areas. Distribution: Panarctic, Mt. Shasta.

Melomastia shastensis Earle. — On *Abies magnafica* var. *shastensis.* — Collected by E. B. Copeland on Shasta fir in 1904. Only published record found occurs in Bull. N. Y. Bot. Gard. 1904: 292. Apparently this was collected in the vicinity of Horse Camp, or at some point along the route of the Sisson Southern Trail in the Shasta Fir zone.
Abundance: V, A. Associate: *Abies magnifica* var. *shastensis.* Distribution: Mt. Shasta.

Metasphaeria sepalorum Vleugel. — On *Juncus parryi, Carex multicaulis.* — In contrast to most species in this group this species develops in a stroma-like structure usually on the perianth segments but also occasionally on the peduncles and scapes.
Collections: 10303, 18167, 24055, 25637. Dates: One collection each in 1938, 1940 and 1941; 3 July 1946, 5 July 1948; 25 Aug. 1949. Abundance: III, C. Associates: *Abies magnifica* var. *shastensis, Tsuga mertensiana.* Distribution: On 3 species of *Juncus* and 1 of *Luzula,* Iceland, Spitzbergen, Swedish Lappland, Sweden; Medicine Bow Mts., Wyoming; Cascade Peaks in Oregon and Washington; Tioga Pass and Mt. Shasta, California.

Neopeckia coulteri (Pk.) Sacc. — On *Pinus albicaulis.*
This "smothering fungus" occurs only on white bark pine on Mt. Shasta. It is fairly common and looks as if some tent caterpillar had formed a dense brown web on the infected branch of the infected tree. Its occurrence is scattered and nowhere can the death of individuals over large areas (as in the case of the "ghost forest" caused by *Arceuthobium campylopodum* f. *cyanocarpum* on the same host) rather than just twigs or branches, be attributed to the smothering action of this fungus.
Collections: 8599, 10250, Exs. 35. Dates: 28 July 1937, 28 July 1938. Observed throughout the season in each year between 1936 and 1942 and in 1946 and 1947. Abundance: III, A. Associates: *Abies magnifica* var. *shastensis, Tsuga mertensiana.* Distribution: Western North America, Europe, Mt. Shasta.

Linospora brunnellae Ell. & Ev. — On *Prunella vulgaris.* — Collected at Sisson (Mt. Shasta) by M. A. Howe (118), July 24—Aug. 10, 1894. Record based on a specimen at the New York Botanical Garden.

Massarinula lignorum L. E. Wehmeyer. — On *Acer glabrum.* — On trees along the usually dry creek below the Sisson Southern Trail spring, 6500 ft.
Collection: 20403 (type). Date: 8 Aug. 1947. Abundance: V, B. Associates: *Abies concolor, Abies magnifica* var. *shastensis, Pinus lambertiana.* Distribution: Known only from the type collection.

Pleospora anthyllidis Auersw. — On *Arnica viscosa.* — Abundance: IV, C. Associates: *Eriogonum marifolium, Polygonum shastense.* Distribution: On two hosts in Europe; Mt. Shasta.

Pleospora balsamorhizae Tracy & Earle. — On *Lupinus albicaulis* var. *shastensis, Lupinus obtusilobus.* — Occasionally found on pieces of overwintered herbage in litter. Horse Camp area and Wagon Camp-Horse Camp Trail, Shasta Fir zone. Abundance: III, C.

On *Silene douglasii* var. *douglasii.* — On overwintered herbage, north side of Mt. Shasta above Bolam Station, Shasta Fir zone.
Collection: 25660. Date: 26 Aug. 1949. Abundance: IV, C. Associates: *Abies magnifica* var. *shastensis, Pinus ponderosa.* Distribution: Southern Colorado, Mt. Shasta.

Pleospora ambigua (Berl. & Bres.) Wehmeyer var. *ambigua.* — On *Lupinus albicaulis* var. *shastensis.*
Collection: 15739. Date: Aug. 1941. Abundance: V, C. Associate: *Abies magnifica* var. *shastensis.*

On *Aster shastensis.*
Collection: 18234. Date: Aug. 1946. Abundance: V, C. Associate: *Abies magnifica* var. *shastensis.* Distribution: Colorado, Mt. Shasta.

Pleospora elynae (Rab.) Ces. & de Not. — On *Carex spectabilis, Juncus mertensianus.* — On overwintered herbage in the spring area above Horse Camp and in the South Gate springs, 8000—8250 ft.
Collections: Collected once in 1937; 18427. Dates: 1937, 2 Sept. 1946. Associates: Herbs of the meadows. Distribution: On 17 species of *Juncus* and *Gramineae:* Greenland, Spitzbergen. Scandinavia, Switzerland, Arctic America, Mt. Shasta.

Pleospora gigaspora Karst. — (*Pleospora amplispora* Ell. & Ev.) — On *Lupinus albicaulis* var. *shastensis, Lupinus obtusilobus.* — On overwintered herbage in the Horse Camp area and along the Horse Camp-Wagon Camp Trail.
Abundance: III, C. Associate: *Abies magnifica* var. *shastensis.* Distribution: on *Eriophorum, Elymus, Hypochaeris, Lupinus* in Lappland, Denmark, Siberia, Washington, Mt. Shasta.

Pleospora herbarum (Pers.) Rab. — On *Agrostis thurberiana, Arnica viscosa, Eupatorium occidentale, Iliamna bakeri, Silene douglasii.*

On overwintered herbage from 4500 ft. in the chaparral along the Sisson Southern Trail and above Hotlum Station, to the Horse Camp

area at 8000 ft. Abundance: II, C. Distribution: On at least 15 monocot and dicot herbs; Europe, Siberia, Java, New Zealand, America, Panarctic, Mt. Shasta.

Pleospora permunda (Cke.) Sacc. — On *Anemone occidentalis, Arabis platysperma, Castilleja pinetorum, Cycladenia humilis, Ligusticum grayi, Monardella odoratissima, Pentstemon gracilentus* (Exs. 36). Abundance: I, C. Associates: Hosts scattered throughout most zones. Distribution: On dead stems in California, Mt. Shasta.

Pleospora tragacanthae Rab. — On *Phlox douglasii.* — On plants along the south side of Red Butte, 8000 ft.
Collection: 25613. Date: 24 Aug. 1949. Abundance: V. C. Associates: *Abies magnifica* var. *shastensis, Tsuga mertensiana.*

Pleospora spp. — On *Aster shastensis, Castilleja arachnoidea* var. *shastensis, Juncus mertensianus, Lupinus albicaulis* var. *shastensis, Veratrum californicum.*
On overwintered herbage in most locations on the mountain as yet unidentified species of *Leptosphaeria* and *Pleospora* seem to be quite common. Abundance: II, C.

Pyrenophora fenestrata Pk. — On *Castilleja pinetorum.* Abundance: IV, C. Associates: *Arctostaphylos patula, Ceanothus velutinus.* Distribution: Utah, Mt. Shasta.

Pyrenophora hispida (Niessl.) Sacc. — On *Aster shastensis.*
Abundance: V, C. Associates: *Arctostaphylos patula, Ceanothus velutinus.* Distribution: On stems in Europe; Mt. Shasta.

Pyrenophora trichostoma (Fr.) Fckl. — On *Juncus balticus* var. *montanus.*
Abundance: V, C. Distribution: On grass stems in Europe; Mt. Shasta.

Teichospora chevalieri Karst. — Collected on a dry piece of coniferous wood at Bear Springs, 5000 ft.
Collection: 15577—A. Date: 18 July 1941. Abundance: V, A. Associates: *Libocedrus decurrens, Pinus jeffreyi.* Distribution: Europe, Mt. Shasta.

Teichospora megastega Ell. & Ev. — On *Haplopappus bloomeri* var. *angustatus.* — On woody branches at Horse Camp, 8000 ft.
Collection: 20438. Date: 15 Aug. 1947. Abundance: IV, B. Associate: *Abies magnifica* var. *shastensis.* Distribution: Western North America, Mt. Shasta.

Thyridaria californica Rehm. — On *Purshia tridentata.* — In the chaparral along the Military Pass road a mile north of Andesite Station on the north side of the mountain.
Collection: 19414. Date: 9 April 1947. Abundance: IV, B. Associates: *Cercocarpus ledifolius, Arctostaphylos patula.* Distribution: Los Angeles Co., California; Mt. Shasta.

Trichosphaeria solaris (Cke. & Ell.) Ell. & Ev. — On *Abies magnifica* var. *shastensis*.
Collection: 15565. Date: 16 July 1941. Abundance: IV, A. Associates: *Abies magnifica* var. *shastensis*. Distribution: Europe, Eastern North America, California, Mt. Shasta.

Venturia kalmiae Peck. — On *Kalmia polifolia*. — In the heather meadows at Panther Creek Meadows.
Collection: 20449. Date: 15 Aug. 1947. Abundance: V, B. Associates: *Phyllodoce empetriformis, Vaccinium caespitosum*. Distribution: New York, Mt. Shasta.

Note: A number of species of ascomycetous fungi develop perfect stages on dead herbaceous material. Usually the herbaceous material can be assigned to the plant which produced it. Following the frosts at the end of August or in early September the host part dies and is soaked by the rains, the water melting from hail storms, sleet or snow cover. The dead or dying host parts, which were perfectly healthy and without sign of fungus infection prior to the frosts, thus become thoroughly water soaked and, when not frozen, present excellent habitats for fungi. From November to June, in normal years, these plant parts are covered by the snow pack, although snowfall starts as early as September as low as 8000 feet, the elevation of these observations. During the period of the pack the plant remains under it are probably well watered and evidently well insulated against freezing; a very high relative humidity is probably characteristic of such habitats. Within two weeks after the pack has melted the herbage has become thoroughly dry and brittle. Thus these mature fungi, with which are associated imperfect species, which may or may not be their imperfect stages, probably developed under the snow pack.

Hysteriales.

Hysteriaceae.

Gloniella lapponica Karst. — On *Arctostaphylos nevadensis*. — On dead branches and twigs near the upper limits of the range of the host in the Horse Camp area.
Collections: 15639, 18189, 20455, Exs. 207. Dates: 26 July 1941, 8 July 1946, 15 Aug. 1947. Abundance: III, B. Associate: *Abies magnifica* var. *shastensis*. Distribution: Lappland, Mt. Shasta.

Hysterium acuminatum Fr. var. *alpinum* Rehm. — Collected on wood of *Abies magnifica* var. *shastensis*, on bark of *Tsuga mertensiana* and on boards of *Pinus ponderosa*, Horse Camp area and Panther Creek Meadows, 7600—8000 ft.
Abundance: IV, A. Associates: *Abies magnifica* var. *shastensis, Tsuga mertensiana*. Distribution: Tyrol, Mt. Shasta.

Hysterium magnosporum Ger. — On *Athyrium americanum.* — Although it was looked for at intervening periods this species has been collected only in 1937 and 1946 on overwintered stalks in Horse Camp Creek where a large host colony occurs.
Collections: 8565, 18152-A, Exs. 33, 33-A. Dates: 7 July 1937, 2 July 1946. Abundance: IV, C. Associate: *Cryptogramma acrostichoides.* Distribution: New York, California, Mt. Shasta.

Hysterographium formosum (Cke.) Sacc. — Collected on white bark pine and Shasta fir twigs which were dead and which were either still on the tree or had just fallen to the ground. The fungus fruited on the bark. Around the flat below Horse Camp, 8000 ft.
Collections: On Shasta fir: 8512, 8531, Exs. 34; on white bark pine: 8527, 8600, 18246. Dates: 22, 26 June, 28 July 1937; 16 July 1946. Abundance: IV, A. Associates: *Abies magnifica* var. *shastensis, Pinus albicaulis.* Distribution: California, Mt. Shasta.

Lophium dolabriforme Wallr. — On *Juncus balticus* var. *montanus.* — A few hysterothecia were found to be scattered among other fungi on overwintered culms at Horse Camp.
Abundance: V, C. Distribution: Germany, Switzerland, Mt. Shasta.

Discomycetes.
Helotiales.

Dermateaceae.

Hysteropezizella spp. — Possibly two species occur on overwintered herbage, one on *Lupinus obtusilobus,* the other on *Arnica viscosa.* — Abundance: IV, C.

Laetinaevia veratri Cash. — On *Veratrum californicum.* On overwintered herbage and stems in wet places at Wagon Camp, 5700 ft.
Collection: 18009. Date: 21 June 1946. Abundance: V, C. Associates: Meadow herbs. Distribution: Known only from this locality.

Tympanis pithya (Karst.) Karst. — On *Pinus albicaulis.* — Found in the Horse Camp area on bark of twigs following the winter's snow pack.

Collections: 8530, 8535, 8538, 8543, 8598, 18043, Exs. 259. Dates: 26, 29 June, 28 July 1937; 24 June 1946. Abundance: III, A. Associate: *Abies magnifica* var. *shastensis.* Distribution: Northern Europe, Western North America, Mt. Shasta.

Phacidiaceae.

Bifusella acuminata (Ell. & Ev.) Bonar & W. B. Cke. — On *Juncus parryi.* — The culms of many clumps of this host are commonly found covered with this fungus after the melting of the snow

pack. Collections have been made throughout the timberline region on the southwest side of the mountain.
Collections: 10303, 18090, Exs. 181. Dates: 10 Sept. 1938, 27 June 1946. Abundance: II, C. Associates: *Abies magnifica* var. *shastensis, Pinus albicaulis.* Distribution: On *Juncus* in Colorado; on *Juncus parryi* on most of the Cascade Peaks; Mt. Shasta.

Clithris crispa (Pers.) Rehm. — On *Abies magnifica* var. *shastensis.* — This species is found on dead Shasta fir wood either as small black slits on the wood when dry or as grey cups when moistened by melting snow. It is also found on blackened areas on old wood throughout the range of the host.

On *Tsuga mertensiana* (Bong.) Sarg. — Found once on wood south of Red Butte at 7500 feet.
Collections: One collection in 1941; 18308, 18269-B, 18356, 18357, 18416, 20272, 25625, 25635, 28243 Dates: 1941; 19, 29 July, 10, 29 Aug. 1946; 10 July 1947; 24 Aug. 1949; 1 July 1951. Abundance: III, A. Associates: *Abies magnifica* var. *shastensis, Tsuga mertensiana.* Distribution: Europe, Western North America, Mt. Shasta.

Cryptomycina pteridis (Rebent. ex Fr.) v. Hoehn. — On *Pteridium aquilinum* var. *pubescens.* — Found only once and then with *Ramularia pteridis* at Wagon Camp in fir woods near the meadows, 5700 ft.
Collection: 20431. Date: 15 Aug. 1947. Abundance: V, C. Associates: *Abies concolor, Abies magnifica* var. *shastensis.* Distribution: Siberia, Europe, North America; Mt. Shasta.

Elytroderma deformans (Weir) Darker. — On *Pinus ponderosa.* — A specimen was reported by W. D. Wagener in the Forest Pathology Herbarium in the San Francisco field office (97725), collected by K. A. Salman, 2 June 1934 at Stevens Pass, Tennant, Siskiyou Co., Calif. In the herbarium of J. S. Boyce are specimens from Goosenest Mountain and Pilgrim Creek Nursery, Siskiyou Co., California.

On *Pinus jeffreyi.* — A specimen was reported by G. D. Darker in the herbarium of the office of Forest Pathology, San Francisco, collected by E. P. Meincke, Sh. D. 4, from Sisson Tavern Park, "Shasta Co." (now Mount Shasta, Siskiyou Co.), Calif.

Hypoderma ?abietinum Ell. & E. — On Shasta fir bark at Horse Camp, 8000 ft.
Collection: 18162. Date: 3 July 1946. Abundance: IV, A. Associate: *Abies magnifica* var. *shastensis.* Distribution: Colorado, Mt. Shasta.

Hypoderma robustum Tub. — On *Abies concolor.* — The most common needle cast found on the mountain. The needles on a number of branches of several trees on the lava flow terminating at MacBride Springs, and along the Sisson Southern Trail just south of the flow, were infected.

Collections: 13419, 20348, 20409, Exs. 69; Darker reported a collection in the herbarium of the San Franzisco field of Forest Pathology, J. S. Boyce (Sh (1) E 6) from Shasta, Siskiyou Co., California. Dates: 25 Aug. 1939; 25 July, 8 Aug. 1947. Abundance: III, A. Associates: *Libocedrus decurrens, Pseudotsuga taxifolia.* Distribution: Southern California to Southern British Columbia; Mt. Shasta.

Hypodermella sp. — On *Pinus albicaulis.* — Found on dead wood at Horse Camp and on a ridge south of Horse Camp, 8000—8500 ft. Collections: 18240, 20227. Dates: 13 July 1946, 10 July 1947. Abundance: IV, A. Associates: *Abies magnifica* var. *shastensis, Pinus albicaulis.*

Hypodermella abietis-concoloris (Mayr) Dearness. On *Abies concolor.* — According to Darker (16) material collected "near Mt. Shasta, Cal." prior to 1896 was the basis of this species.

Hypodermella medusa Dearn. — On *Pinus ponderosa.* — Darker (16) reports a specimen (SH. D. 3) in the herbarium of the San Francisco office of Forest Pathology from near Antelope Ranger Station, Siskiyou Co., Calif.

Lophodermina autumnalis (Darker) Tehon. — On *Abies concolor.* — Along the Mud Creek Dam road, south side of the mountain, at 4000 ft. about a mile above McCloud.
Collection: 19335. Date: 8 April 1947. Abundance: V, A. Associates: *Pinus ponderosa, Libocedrus decurrens.* Distribution: Nova Scotia, Ontario, Quebec, Michigan, Utah, Wyoming, Oregon, California, Mt. Shasta.

Lophodermina juniperina (Fr.) v. Hoehn. — On *Juniperus communis* var. *montanus.* — Killing older needles on branches of the host in a small colony on the north side of Gray Butte near the South Gate.
Collection: 16806. Date: 8 Sept. 1942. Abundance: IV, A. Associate: *Pinus albicaulis.* Distribution: Europe, North America, Mt. Shasta.

Lophodermina nitens (Darker) Tehon. — On *Pinus albicaulis.* — Not forming an needle cast in the usual sense but found on leaves fallen from older parts of branches. The imperfect stage precedes, the perfect stage follows, overwintering.
Collections: 8501, 10200, 18017, 18260, Exs. 53. Dates: 24 June 1937; 13 July 1938; 23 June, 16 July 1946. Abundance: III, A. Associates: *Abies magnifica* var. *shastensis, Pinus albicaulis.* Distribution: North America, Mt. Shasta.

Lophodermium phloxii Bonar & W. B. Cke. — On *Phlox douglasii.* — Found in two seasons and then covering a number of plants in a large colony on a flat below the Lodge at Horse Camp and on several plants on gravel slopes above the Lodge. In a previous year *Macrophoma cylindrospora* (Desm.) Berl. & Vogl. was common in the same area and might be the imperfect stage although no cultures were attempted. The latter appeared to be parasitizing healthy plants

while the former was found on dead branches and leaves on dead plants.

Collections: *Macrophoma:* 8553; *Lophodermium:* 10185, 18172, 25613, Exs. 152. Dates: 7 July 1937, 5 July 1938, 7 July 1946. Abundance: IV, C. Assosiates: *Antennaria geyeri, Abies magnifica* var. *shastensis.* Distribution: *Macrophoma:* Europe, Mt. Shasta; *Lophodermium:* Known only from Mt. Shasta.

Lophodermium piceae (Fckl.) v. Hoehn. — On *Abies magnifica* var. *shastensis.* — On needles on trees between Panther Creek Meadows and Wagon Camp, 7000 feet.

Collection: 20435. Date: 15 Aug. 1947. Abundance: V, A. Associate: *Abies magnifica* var. *shastensis.* Distribution: Europe, Eastern and western North America, Mt. Shasta.

Lophodermium pinicolum Tehon. — On *Pinus lamberliana, Pinus ponderosa.* — Common on fallen branches along the Sisson Southern Trail between 5000 and 5500 feet.

Collections: 18364, 18365. Date: 16 Aug. 1946. Abundance: III, A. Associates: *Abies concolor, Pseudotsuga taxifolia.* Distribution: Japan, New Zealand, Europe, North America, Mt. Shasta.

Odontotrema minus Nyl. — Forming areas of black spots on silvered, weathered, unpainted, hand-hewn boards of Shasta fir in Horse Camp installations.

Collections: 13425, 18001, 18269-A, Exs. 213. Dates: 13 Sept. 1939; 16 June, 19 July 1946. Abundance: III, A. Associate: *Abies magnifica* var. *shastensis.* Distribution: Germany, Tyrol, Finland, Mt. Shasta.

Orbiliaceae.

Orbilia coccinella (Som.) Karst. — On *Purshia tridentata.* — North side of Mount Shasta about a mile north of Andesite Station, 5000 feet.

Collection: 19413. Date: 9 April 1947. Abundance: V, B. Associates: *Cercocarpus ledifolius, Arctostaphylos patula.* Distribution: Northern and Central Europe, Mt. Shasta.

Patellariaceae.

Leciographa dispersa Syd. — On *Phyllodoce empetriformis.* — Found once at the water supply spring above Horse Camp. Collection: 20462. Date: 20 Aug. 1947. Abundance: V, B. Associates: Herbs of the spring meadow. Distribution: Europe, Mt. Shasta.

Tryblidiella macrospora Bonar & Cash. — On *Libocedrus decurrens.* — Found once on branches at Bear Springs, 5000 ft. Collection: 26797. Date: 1 July 1950. Abundance: V, A. Associates: *Pinus ponderosa, Abies concolor.* Distribution: California; Mt. Shasta.

Hyaloscyphaceae.

Hyaloscypha atomaria (Starb.) Nannf. — On Shasta fir logs at Horse Camp, 8000 feet. Observed only when the wood was still wet from welting snow.
Collections: 18060, 20058, 20367, 20369. Dates: 25 June 1946; 22 June, 24 July 1947. Abundance: III, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, North America, Mt. Shasta.

Lachnum bicolor (Bull. ex Fr.) Karst. — On *Acer glabrum, Castanopsis chrysophylla, Ceanothus velutinus.* — Found on dead twigs and branches of these shrubs lying partially buried in litter at the base of the plants.
Collections: 15722, 15728, 20023. Dates: 18 Aug. 1941, 20 June 1947. Abundance: IV, B. Associates: *Arctostaphylos patula, Abies concolor, Abies magnifica* var. *shastensis*. Distribution: Europe, Iceland, China, North America, Mt. Shasta.

Lachnum setigerum (Phil.) Lindau. — On *Arnica viscosa.* — On the bases of stems of the host after overwintering under snow packs, especially where a large number of such herbaceous stems occur together.
Collections: 15623, Exs. 154. Date: 28 July 1941. Abundance: IV, C. Associates: *Eriogonum marifolium, Polygonum shastense.* Distribution: Western North America, Mt. Shasta.

Helotiaceae.

Belonioscypha campanula (Fr.) Rehm. — On *Eriogonum marifolium.* — On several plants at 8100 ft. Following the snow pack small, pink, immature, later large, brown, mature fruit bodies found on overwintered peduncles.
Collection: 10198, Exs. 156. Date: 13 July 1938. Abundance: V, C. Associates: *Polygonum shastense, Arnica viscosa.* Distribution: Germany, Finland, Mt. Shasta.

Cenangium sp. — On *Abies magnifica* var. *shastensis.* — On dead branches along the Sisson Southern Trail at 7500 ft.
Collections :18350, 18355. Date: 10 Aug. 1936. Abundance: IV, A. Associate: *Abies magnifica* var. *shastensis.*

Ciboria rufo-fusca (Web.) Sacc. — On *Abies magnifica* var. *shastensis.* — On cone scales in litter at Horse Camp.
Collection: 20134. Date: 25 June 1947. Abundance: V, A. Associates: *Abies magnifica* var. *shastensis.* Distribution: Germany, Mt. Shasta.

Dasyscypha acanthonitschkia Cash & Davidson. — On *Acanthonitschkia coloradensis.* — Occasional on ponderosa pine boards used in construction of unpainted cabins at Horse Camp, 8000 ft. Boards were in use 8 years.
Collection: 18369. Date: 17 Aug. 1946. Abundance: V, F. Associate: *Abies magnifica* var. *shastensis.* Distribution: Colorado, Mt. Shasta.

Dasyscypha agassizii (Berk. & Curt.) Sacc. — On *Abies magnifica* var. *shastensis, Pinus albicaulis, Tsuga mertensiana.* — Occasional on wood throughout the Shasta Fir and Withe Bark Pine zones.

Collections: Collected twice in 1939; 18048, 18165, 18421, 20486, 25605, Exs. 67. Dates: 1939; 25 June, 3 July, 29 Aug. 1946; 28 Aug. 1947; 24 Aug. 1949. Abundance: III, A. Associates: The coniferous hosts within their respective associations. Distribution: New England, Wisconsin, California, Mt. Shasta.

Dasyscypha aplopappi Cash. — On *Haplopappus bloomeri var. angustatus.* — Common on dead branches of this small shrub after the snow melts in June at Horse Camp.

Collections: 18082, 18175, 18180 (type). Dates: 27 June, 7, 8 July 1946. Abundance: III, B. Associate: *Abies magnifica* var. *shastensis.* Distribution: Known only from this locality.

Dasyscypha arida (Phil.) Sacc. — On *Abies magnifica* var. *shastensis.* — This is the commonest discomycete in the Horse Camp area. It does not form cankers but it does fruit on living stunted Shasta firs at the upper limits of the main forest of the Shasta Fir zone. In these places it fruits abundantly on parts of trees injured by the snow pack in which cases it may complete the destruction of the infected parts. It also occurs on parts of trees injured by avalanches.

Collections :7582, 7600, 7639, 8515, 8523, 8524, 8534, 8540, 8548, 8549, 8550, 8551, 13311, 13315, 13316, 15595, 15645, 18042, 18351, Exs. 66. Dates: 9, 25 Aug., 10 Sept. 1936; 19, 22, 29 June 1937; 5 July 1939; 23, 29 July 1941; 24 June, 10 Aug. 1946. General: Observed throughout the season from 10 June through 15 September, especially whenever fruit bodies are revived by rain or melting snow, in every year from 1936 through 1948 and on the occasional visits since. Abundance: I, A. Associates: *Pinus albicaulis, Tsuga mertensiana.*

On *Pinus albicaulis.*

Collections: 8532, 8539, 18245, 20485. Dates: 26, 29 June 1937; 16 July 1946; 8 Aug. 1947. Abundance: III, A. Associates: *Abies magnifica* var. *shastensis, Tsuga mertensiana.*

On *Pinus lambertiana.*

Collection: 18370. Date: 16 Aug. 1946. Abundance: IV, A. Associates: *Abies concolor, Libocedrus decurrens.*

On *Abies concolor.*

Collections: 8662, 18420, 28329. Dates: 24 Aug. 1937, 29 Aug. 1946; *Abies magnifica* var. *shastensis.*

On *Tsuga mertensiana.*

Collextions: 8662, 18420, 28329. Dates: 24. Aug. 1937, 29 Aug. 1946; 3 July 1951. Abundance: III, A. Associate: *Abies magnifica* var. *shastensis.* Distribution: Western North America, Mt. Shasta.

Dasyscypha flammea (Alb. & Schw.) Fr. — On *Cercocarpus ledifolius.* — On dead branches near Andesite Station at 5000 ft. at the north base of the mountain.
Collection: 19399. Date: 9 Apr. 1947. Abundance: V, B. Associates: *Arctostaphylos patula, Ceanothus velutinus.*

On *Haplopappus bloomeri* var. *angustatus.* — On dead branches in the timberline area above Horse Camp.
Collection: 15596-A. Date: 18 July 1941. Abundance: V, B. Associates: *Eriogonum marifolium, Polygonum shastense.* Distribution: Europe, Iceland, Ceylon, North America, Mt. Shasta.

Dasyscypha nivea Sacc. — On *Arctostaphylos patula.* — Found once on partially buried sticks along the Junction road in a tongue of chaparral extending up to the lower part of the Shasta Fir zone.
Collection: 15723. Date: 18 Aug. 1941. Abundance: V, B. Associates: *Ceanothus velutinus, Castanopsis chrysophylla.* Distribution: Europe, North America, Mt. Shasta.

Dasyscypha phlogis Cash. — On *Phlox douglasii.* — On dead branches on plants on west side of Shastina, 9000 ft. and below Horse Camp, 7750 ft.
Collection: 20484 (Type). Date: 27, 28 Aug. 1947. Abundance: V, B. Associates: *Pinus albicaulis, Abies magnifica* var. *shastensis.* Distribution: Known only from these collections.

Dasyscypha salmonea Cash. — On *Haplopappus bloomeri* var. *angustatus.* — Common on dead branches of this small shrub after the snow melts in June at Horse Camp.
Collections: 18081, 18174, 18179 (type), 27015. Dates: 27 June, 7, 8 July 1946; 28 Sept. 1950. Abundance: III, B. Associate: *Abies magnifica* var. *shastensis.* Distribution: Known only from these collections.

Dasyscypha serinella (Quel.) Sacc. — In a handful of litter from under a mountain hemlock tree in Panther Creek meadows in which the largest percentage of organic matter was hemlock needles, 586 needles had at least one fruit body each of this species; some needles carried as many as four or five cups. Litter of Shasta fir needles at Horse Camp and white bark pine at 9000 feet on ridges above Horse Camp also carried small yellow cups of this species.
Collections: on *Tsuga mertensiana*: 15698, 28324; on *Abies magnifica* var. *shastensis*: 18045; on *Pinus albicaulis*: 18259. Dates: 28 July 1941; 25 June, 16 July 1946; 3 July 1951. Abundance III, A; IV, A; IV, A. Associates: The listed tree species. Distribution: Europe, Mt. Shasta.

Dasyscypha succinea (Phill.) Sacc. — On *Ceanothus velutinus, Prunus emarginata.* — Collected on the former host along the Junction Road on branches partially buried in litter, and on branches in the chaparral at McCloud Summit on State Route 89. Also

on the latter host on a root disloged in a road widening operation at Bear Springs.
Collections: 15577-B, 15729-A, 18293. Dates: 18 July, 18 Aug. 1941; 25 July 1946. Abundance: IV, B. Associates: *Arctostaphylos patula, Castanopsis chrysophylla.* Distribution: Colorado, Utah, California, Mt. Shasta.

Durella [*?compressa* (Pers. ex Fr.) Tul.]. — On dead wood of Shasta fir along the Sisson Southern Trail at about 7000 ft.
Collection: 18269. Date: 19 July 1946. Abundance: V, A. Associates: *Abies magnifica* var. *shastensis, Arctostaphylos nevadensis.* Distribution: North America, Mt. Shasta.

Godronia castanopsidis Seaver. — On *Castanopsidis chrysophylla.* — Following a light rain a quantity of material of this species was obtained from dead branches in the chapparal along the Junction Road between Wagon Camp and the Snowline Highway. When dry this species is inconspicuous, when moistened its receptacles are bright yellow. Earlier, in connection with a collection of grass, a fragment of a branch of *Arctostaphylos patula* Greene was found with several fruit bodies.
Collections: 13369, 15717, Exs. 157. Dates: 28 July 1939, 18 Aug. 1941. Abundance: IV, B. Associates: *Ceanothus velutinus, Arctostaphylos patula.* Distribution: Known only from these collections.

Helotium ?virgultorum Vahl. ex Fr. — On *Holodiscus discolor* var. *glabrescens.*
Collection: 20465. Date: 20 Aug. 1947. Abundance: V, B. Associates: *Eriogonum marifolium, Polygonum shastense.* Distribution: Europe, North America, Mt. Shasta.

Helotium sp. — On *Castanopsis sempervirens.* — On dead branches under shrubs on ridges north of Horse Camp at about 8500 ft. Immature.
Collection: 18252. Date: 16 July 1946. Abundance: V, B. Associate: *Holodiscus discolor* var. *glabrescens.*

Lachnellula chrysophthalma (Pers. ex Fr.) Karst. — Collected on hand hewn boards of Shasta fir at Horse Camp, and on old withe bark pine wood near Horse Camp.
Collections: Collected once in 1938; 15627. Dates: 1938; 28 July 1941. Abundance: IV, A. Associates: *Abies magnifica* var. *shastensis, Pinus albicaulis.* Distribution: Europe, North America, Mt. Shasta.

Mollisia hysterioides Cash. — On *Haplopappus bloomeri* var. *angustatus, Phlox douglasii.* — Occasional on dead branches of these small shrubs on open flats around Horse Camp, 8000 ft.
Collections: 18173, 18176, 18178 (type). Dates: 7, 8 July 1946. Abundance: V, B. Associates: *Abies magnifica* var. *shastensis, Polygonum shastense.* Distribution: Known only from these collections.

Mollisia shastensis Cash. — On *Eriogonum pyrolaefolium.* — Stems of this host develop underground and on death of the host become exposed. The plant grows in Alpine zone locations and few fungi have been found on it. North Ridges, 9000 ft.
Collections: 20483, 20605 (type). Dates: 28 Aug., 4 Sept. 1947. Abundance: V, C. Associates: *Agoseris monticola, Hulsea nana.*

On *Arctostaphylos nevadensis.* — On branches of shrubs between Horse Camp and Panther Creek Meadows.
Collection: 20456. Date: 15 Aug. 1947. Abundance: V, B. Associate: *Abies magnifica* var. *shastensis.* Distribution: Known only from these collections.

On *Eriogonum marifolium.* — South side of Red Butte, 8000 ft.
Collection: 25614. Date: 24 Aug. 1949. Abundance: V, C. Associates: *Abies magnifica* var. *shastensis, Tsuga mertensiana.*

Patellea californica Rehm. — On *Arctostaphylos patula, Salix scouleriana.* — On dead branches in a tongue of chaparral in the lower Shasta Fir zone, 6000 ft., intersected by the Junction Road; and along the old Sisson Southern Trail, 4500 ft.
Collections: 15735, 19304. Dates: 18 Aug. 1941, 7 April 1947. Abundance: V, B. Associates: *Ceanothus velutinus, Castanopsis chrysophylla.* Distribution: California, Mt. Shasta.

Patellea umbrorum (Fr.) Seaver. — On rotten conifer wood at Wagon Camp.
Collection: 20427. Date: 15 Aug. 1947. Abundance: V, A. Associates: *Abies concolor, Abies magnifica* var. *shastensis.* Distribution: Europe, North and South America, Mt. Shasta.

Patinella abietina (Cke.) Sacc. — On *Abies magnifica* var. *shastensis.* — On dead branches at Horse Camp, 8000 ft.
Collection: 18225. Date: 10 July 1946. Abundance: V, A. Associate: *Abies magnifica* var. *shastensis.*

On *Phyllodoce empetriformis.* — On dead branches along Causeway below Horse Camp Springs, 8100 ft.
Collections: 18309, 20462. Dates: 30 July 1946, 20 Aug. 1947. Abundance: IV, B. Associates: *Eriogonum marifolium, Polygonum shastense.* Distribution: California, Mt. Shasta.

Patinella atro-viridis Rehm. — On *Pinus albicaulis.* — A large dry branch of the host found at 9000 ft. in the White Bark Pine zone on ridges north of Horse Camp was covered with this species.
Collection: 18258, Exs. 215. Date: 16 July 1946. Abundance: IV, A. Associate: *Pinus albicaulis.* Distribution: Tyrol, Mt. Shasta.

Pezizella helotioides Starb. — On *Allium vallidum.* — On overwintered leaves in a spring area above Wagon Camp, 5800 ft.
Collection: 18008-A. Date: 21 June 1946. Abundance: V, C. Associates:

Abies magnifica var. *shastensis, Arnica mollis.* Distribution: Sweden, Mt. Shasta.

Phialea sp. — A number of small brown cups were collected on leaves of a species of *Carex* from around the base of a clump along the Horse Camp-Wagon Camp Trail at about 7000 ft.
Collection: 15740. Date: 18 Aug. 1941. Abundance: V, C. Associate: *Abies magnifica* var. *shastensis.*

Rutstroemia sp. — On *Castanopsis sempervirens.* — On dead branches under shrubs in the White Bark Pine zone near Horse Camp.
Collection: 18252. Date: 16 July 1946. Abundance: V, B. Associates: *Arctostaphylos nevadensis, Hollodiscus discolor* var. *glabrescens.*

Scelobelonium melanosporum (Rehm) v. Hoehn. — On overwintered stems, petioles and peduncles of *Agrostis thurberiana, Anemone occidentalis, Juncus balticus* var. *montanus* and *Pentstemon gracilentus.*
Collections: Collected at least five times between 1936 and 1942; 18311, Exs. 68. Dates: 1936—1942; 30 July 1946. Abundance: III, C. Associates: Plants of the Shasta Fir and White Bark Pine zones. Distribution: Europe, Western North America, Mt. Shasta.

Scleroderris ?abieticola Zeller & Gooding. — On Shasta fir bark on a tree along the Sisson Southern Trail at 7500 ft.
Collection: 18350. Date: 10 Aug. 1946. Abundance: V, A. Associate: *Abies magnifica* var. *shastensis.* Distribution: Oregon, California; Mt. Shasta.

Sclerotinia sp. — Two small specimens were obtained in the healter meadows at Panther Creek meadows at about 7500 ft.
Collection: 15625. Date: 28 July 1941. Abundance: V, D. Associates: *Phyllodoce empetriformis, Kalmia polifolia, Vaccinium caespitosum.*

Tapesia fusca (Pers. ex Fr.) Fckl. — On *Ceanothus velutinus.* — On twigs of the host partially buried under undisturbed debris along the Junction road.

On *Arctostaphylos nevadensis.* — Specimens referred tentatively to this species from Horse Camp.
Collections: 15729-A, 18185. Dates: 18 Aug. 1941; 8 July 1947. Abundance: V, B. Associates: *Arctostaphylos patula, Castanopsis chrysophylla, Abies magnifica* var. *shastensis.* Distribution: Europe, Iceland, Siberia, Alaska, Panama, North America, Mt. Shasta.

Tapesia melaleucoides var. *vaccinii* Rehm. — On *Arctostaphylos nevadensis.* — On dry twigs of shrubs along a ridge below Horse Camp, 8000 ft.
Collections: 15639-B, 18185. Dates: 26 July 1941, 8 July 1946. Abundance: IV, B. Associates: *Abies magnifica* var. *shastensis.* Distribution: Europe, Michigan, Mt. Shasta.

Trichoscyphella tenuipilosa Cash. — On *Abies magnifica* var. *shastensis.* — South side of Red Butte, 7500 ft.
Collection: 25605. Date: 24 Aug. 1949. Abundance: V, A. Associate: *Tsugt mertensiana.* Distribution: Eastern Washington, Mt. Shasta.

Pezizales.

Pezizaceae.

Discina ancilis (Pers.) Sacc. — On the soil near Shasta fir logs, on soil around various buildings at Horse Camp, 8000 ft., on soil under ponderosa pines at 5500 ft. Specimens on various kinds of coniferous litter and duff have been collected from between 5000 and 8000 ft. In 1946 material was collected on sawdust, and on burned and unburned soil under a woodpile.
Collections: 8619, 10118, 10157, 10161, 10175, 10179, 10183, 10187, 10190, 10196, 10262, 15515, 15516, 15536, 15681, 18014, 18027, 18150, 18169, 20137, 28289, Exs. 223. Dates: 6 Aug. 1937; 17, 24, 26 June, 1, 3, 5, 6, 7, 8, 29 July 1938; 12 June, 9 July, 7 Aug. 1941. 22, 23 June, 2, 5 July 1946; 25 June 1947; 3 July 1951. Abundance: II, D. Associates: Conifer trees of all zones. Distribution: Europe, North America, Mt. Shasta.

Geopyxis cupularis (L.) Sacc. — On rotten wood near Wagon Camp, 5700 ft.
Collection: 20427. Date: 15. Aug. 1947. Abundance: V, A. Associates: *Abies concolor, Abies magnifica* var. *shastensis.* Distribution: Europe, North America, Mt. Shasta.

Geopyxis vulcanalis (Pk.) Sacc. — One colony was found on fir duff along the Sisson Southern Trail, 6500 feet.
Collection: 15529. Date: 3 July 1941. Abundance: V, D. Associates: *Abies concolor, Abies magnifica* var. *shastensis.* Distribution: New York, Wyoming, Oregon, California, Mt. Shasta.

Humaria scutellata (L. ex Fr.) Fckl. — Small colonies of this red cup were found on a Shasta fir log in the Sisson Southern Trail spring and in a creek at Wagon Camp; on an incense cedar log in a small creek between Bear Springs and Wagon Camp; and on an overwintered prostrate stem of *Veratrum californicum* in Panther Creek Meadows, 5000—7500 feet.
Collections: 8577, 8631, 8655-A, 20412, 25641, Exs. 257. Dates: 9 July, 13, 20 Aug. 1937; 8 Aug. 1947; 25 Aug. 1949. Abundance: IV, A. Associates: Conifers of Shasta Fir and Sierra Mixed Conifer zones. Distribution: Europe, North America, Mt. Shasta.

Lamproderma leiocarpa (Carr.) Seaver. — Around burned ground in camp fire areas along the Sierra Lodge Ski Trail in Shasta fir woods at about 7250 feet.
Collection: 18149. Date: 2 July 1946. Abundance: IV, D. Associates: *Abies magnifica* var. *shastensis.* Distribution: Europe, Western North America, Mt. Shasta.

Caloscypha fulgens Boud. — This species grows near melting snow banks on Shasta fir litter and duff although it may also be found in fresh condition in woods from which the snow had melted a month before. It has been observed in all summers from 1937 through 1941 and was especially abundant in 1941. In 1951 large areas were covered with all sizes of fruit bodies several weeks after melting of snow.
Collections: 10156, 10194, 14608, 14613, 15532, 15539, 15541, 15588, 18114, 18413, 28245, 28268, Exs. 135. Dates: 24 June, 8 July 1938; 14 June 1940; 9, 11, 12, 18 July 1941; 28 June, 2 July 1946; 1, 2 July 1951. Abundance: II, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, North America, Mt. Shasta.

Patella coprinaria (Cke.) Seaver. — On deer dung. — Shasta fir woods on the ridge between Horse Camp and Panther Creek.
Collection: 28294. Date: 2 July 1951. Abundance: V, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, New York to Nebraska, California; Mt. Shasta.

Paxina nigrella Seaver. — Found at first in 1938 and then in 1940 just after melting of the snows along the Sisson Southern Trail in deep Shasta fir woods on litter. Later, in 1941, the species was observed in abundance on Shasta fir litter at the edge of melting snow banks near Horse Camp. As the snow would move back a new area of production of these fruit bodies would develop. Five such areas were noted within a hundred feet near a protected snowbank at the edge of a grove of Shasta firs throughout July. Over 100 fruit bodies were collected.
Collections: 10105, 14604, 15531, 15551, 15592, 15626, 15648, 18214, 24054, 28318 Exs. 126. Dates: 11 June 1938; 10 June 1940; 4 July 1948; 3 July 1951. 1941: 9 July, 21 specimens; 14 July, 25 specimens; 21 July, 24 specimens; 28 July, 27 specimens. Abundance: III, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Colorado, Cascade Mountains of Oregon and Washington, Mt. Shasta.

Peziza violacea Pers. — On soil near spilled cement at the spike camp at Panther Creek Meadows Public Camp Ground, 7600 feet.
Collection: 15632, Exs. 127. Date: 28 July 1941. Abundance: V, D. Associates: *Abies magnifica* var. *shastensis, Tsuga mertensiana*. Distribution: Europe, North America, Mt. Shasta.

Rhyparobius monascus Mouton. — On deer dung. — Shasta fir woods on ridge between Horse Camp and Panther Creek.
Collection: 28294. Date: 2 July 1951. Abundance: V, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, New York, Mt. Shasta.

Sarcosphaera amplissima (Fr.) Kanouse. — This species was collected four times in 1941: On sandy soil under a ponderosa pine tree on the north side of the mountain at about 5000 feet, under a ponderosa pine and chaparral shrubs on the southwest side of the mountain at 5500 feet, in Shasta fir duff on a ridge just below Horse Camp at 7800 ft., In 1942 it was found under pines in a lawn in Mount Shasta at 3550 feet. In 1946 it was found under litter in white fir-Shasta fir woods along the Sisson Southern Trail at 6000 feet. In June 1947 it was abundant throughout the Shasta fir forest especially along the Sisson Southern Trail between 6500 and 8000 feet. Collections: 15518, 15523, 15568, 16630, 18113, 20017. Dates: 12, 27 June, 16 July 1941; 30 May 1942; 28 June 1946; 20 June 1947. Abundance: III, D. Associates: Conifers below the White Bark Pine zone. Distribution: Europe, North Africa, North America, Mt. Shasta.

Helvellaceae.

Helvella californica Phill. — Two or three specimens have been noted in each summer from 1936 to 1941 in mossy sod near the Wagon Camp springs at about 5700 ft.; 18 sporophores were found on a water soaked white fir log forming a dam across Squaw Valley Creek at about 6000 feet; found once on a water soaked log of Shasta fir at Panther Creek meadows at about 7500 feet.
Collections: 7593, 8655, 13324, 13353, 15543, 15582, 16631, 20242, 25642. Dates: 21 Aug. 1936; 20 Aug. 1937; 16 June, 7 July 1939; 12, 18 July 1941; 30 May 1942; 10 July 1947; 25 Aug. 1949. Abundance: IV, A, D. Associates: *Abies concolor, Abies magnifica* var. *shastensis*. Distribution: Nevada, Oregon, California, Mt. Shasta.

Helvella caroliniana (Bosc.) Nees. — Collected once under ponderosa pines at 5500 feet.
Collection: One specimen found in 1941. Abundance: V, D. Associates: *Pinus ponderosa, Arctostaphylos patula.* Distribution: North America, Mt. Shasta.

Morchella esculenta (L.) Pers. — Under yellow pines near the Four-Mile post on the Sisson Southern Trail, 5000 feet; in white fir-Shasta fir woods along the Sisson Southern Trail, 6500 feet; in Shasta fir woods at Sand Flats and along the Sierra Lodge Ski Trail at about 7000 feet; and near a cabin at Horse Camp, 8000 feet.
Collections: 15517, 16629, 18112, 18154, 18168, 20012. Dates: 12 June 1941; 30 May 1942; 28 June, 2, 4 July 1946; 20 June 1947. Abundance: IV, D. Associates: Conifers of zones below the White Bark Pine zone. Distribution: Europe, North America, Mt. Shasta.

Tuberales.

Tuberaceae.

Hydnotria variiformis Gilkey. — Depending on the intensity of the search for this hypogaeous species it is common to

merely occasional. It occurs in rotten Shasta fir logs below or at the soil level, or in the ground near rotting Shasta fir logs. Mostly in the vicinity of Horse Camp at 8000 feet.
Collections: 10217, 13261, 13292, 13332, 13333, 13348, 13307, 13308, 13309, 13371 (type), 14638, 15642, 15676, 18328, 20136, 20188, 28280. Dates: 18 July 1938; 17, 28 June, 5, 13, 20 July 1939; 8 July 1940; 29 July, 7 Aug. 1941; 31 July 1946; 25, 27 June 1947; 3 July 1951. Abundance: III, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Timberline areas on peaks in western Oregon; Medicine Bow Mountains, Wyoming; Mt. Shasta.

Hydnotria tulasnei Berk. & Br. — A specimen has been tentatively identified as this species. Collected in the timberline region on the southwest side of the mountain. Abundance: V, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, Michigan, Mt. Shasta.

Basidiomycetes.
Heterobasidiomycetes.

Uredinales.

Melampsoraceae.

Coleosporium madiae Cke. — On *Madia gracilis*.

Observed on this host only in the Bear Springs area altough the host occurs throughout the chaparral on the southwest side of the mountain between 4000 and 5000 feet.
Collection: 16790. Date: 9 Sept. 1942. Abundance: V, C. Associates: *Libocedrus decurrens, Pinus jeffreyi*. Distribution: On 15 carduaceous hosts from British Columbia to central California; Mt. Shasta.

Coleosporium solidaginis (Schw.) Thuem. — On *Aster shastenis*. — On this host this has been found only on the large form along the Snowline Highway at 4500 feet and on the narrow leafed form the base of Diller Canyon at 5000 feet. The host, however, is found at all elevations and in most dryer areas between 4500 and 9000 feet.
Collection: 15604, Exs. 120. Dates: 25 July 1941; one collection in late August 1940. Abundance: IV, C. Associates: *Arctostaphylos patula, Ceanothus velutinus, Purshia tridentata*. Distribution: On more than 125 species of the Compositae in Mexico, China, Japan, North America, Mt. Shasta.

Cronartium comptoniae Arth. — On *Pinus contorta* var. *latifolia*. — Blister galls were formed on trees in the host colony at Military Pass on the northeast side of the mountain.
Collection: 10283. Date: 22 Aug. 1938. Abundance: IV, A. Associates: *Arctostaphylos patula, Ceanothus velutinus*. Distribution: On 12 species of *Pinus* in North America; Mt. Shasta.

Cronartium pyriforme (Pk.) Hedgc. & Long. — On *Pinus ponderosa.* — Reported from Shasta Springs by Blasdale, 1919.

Hyalopsora polypodii (Pers.) Magn. — On *Cystopteris fragilis.* — A colony of the host in the upper Wagon Camp spring area is regularly heavily infected.
Collections: 8620-B, 9198, 20319, Exs. 38. Dates: 8 Aug. 1937, 18 July 1947. Abundance: IV, C. Associates: *Abies concolor, Abies magnifica* var. *shastensis.* Distribution: On more than two hosts in Alaska, Japan, Europe, northern North America, Mt. Shasta.

Melampsora albertensis Arth. — On *Populus tremuloides.* — Reported by Blasdale, 1919, from Dunsmuir, in the Sacramento Canyon.

Melampsora arctica Rostr. — On *Salix sitchensis.* — One shrub of the host, observed so far only in Mud Creek Canyon, was completely covered by this species.
Collection: 13385, Exs. 2. Date: 10 Aug. 1939. Abundance: III, B. Associates: *Salix* spp., *Abies concolor, Pinus ponderosa.* Distribution: On at least 15 species of *Salix* in boreal regions of Europe and North America; Mt. Shasta.

Melampsora lini (Pers.) Lév. — On *Linum micranthum.* — The colony of this annual host which occurs near the Water Supply spring above Howard was heavily infected in 1941. Other colonies of the host through the chaparral area were uninfected.
Collection: 15575, Exs. 125. Date: 18 July 1941. Abundance: IV, C. Associates: *Arctostaphylos patula, Ceanothus velutinus.* Distribution: On at least 12 species of *Linum* in Europe, Japan, New Zealand, North America, Mt. Shasta.

Melampsora euphorbiae-gerardianae W. Müll. — On *Euphorbia crenulata.* — A specimen collected by E. P. Meincke, L. E. Ekvall and L. S. Gill near McCloud, 16 June 1924, is filed in the San Francisco field office of Forest Pathology, No. 29873.

Melampsora ribesii-purpurae Kleb. — On *Salix scouleriana.* — This host in common along drainage areas throughout the charparral below 5000 feet and occurs along creeks to some extent above that elevation. Its worst enemy is the oyster scale which kills out the larger shrubs. This rust occurs occasionally on isolated shrubs on the leaves of which it forms small, barely noticeable pustules in contrast to the large bright orange ones of *M. arctica.*
Collection: 14674, Exs. 81. Dates: 8 Aug. 1940. Observed in other years. Abundance: IV, B. Associates: *Arctostaphylos patula, Ceanothus velutinus, Castanopsis chrysophylla, Cornus nuttallii.* Distribution: On at least 14 species of *Salix* in Europe, Western Canada and the United States; Mt. Shasta.

Melampsorella cerastii (Pers.) Schroet. — On *Stellaria longipes.* — The colony of this host which occurs at Bear Springs was infected in 1939.
Collection: 13256, Exs. 59. Date: 16 June 1939. Abundance: V, C. Associates: *Libocedrus decurrens, Pinus jeffreyi.* Distribution: On at least 13 species of *Cerastium* and *Stellaria* in Europe, Siberia, Japan, Mexico, North America, Mt. Shasta.

Pucciniastrum goeppertianum (Kuehn.) Kleb. — On *Vaccinium caespitosum.* — In Panther Creek meadows under hemlock and Shasta fir large colonies of this dwarf shrub are completely or only partially infected. It has not been found on conifers where the infection on *Vaccinium* occurs between 7500 and 8000 feet. Collections: 8647, 13329, 13410, 20454, 25619, 25647, Exs. 13. Dates: 17 Aug. 1937; 13 July, 24 Aug. 1939; 15 Aug. 1947; 24, 25 Aug. 1949. Also seen in intervening years. Abundance: II, B. Associates: *Phyllodoce empetriformis, Kalmia polifolia, Abies magnifica* var. *shastensis, Tsuga mertensiana.*

On *Abies concolor.* — Mature trees along a lane between McCloud and Squaw Valley Creek spring between 4000 and 5000 feet were heavily infected on needles on at least the lower branches; also heavily infecting all of several young trees near MacBride Springs, 5000 feet.
Collections: 18277, 20352. Dates: 25 July 1946, 25 July 1947. Abundance: III, A. Associates: *Pseudotsuga taxifolia, Libocedrus decurrens.* Distribution: On at least 12 species of *Vaccinium* and on several conifers in Mexico, Europe, Japan, North America, Mt. Shasta.

Pucciniastrum myrtilli (Schum.) Arth. — On *Vaccinium caespitosum.* — Collected once on a colony of the host in Panther Creek meadows.
Collection: 13410, Exs. 14. Date: 24 Aug. 1939. Abundance: V, B.

On *Vaccinium membranaceum.* — Collected once on a colony of the host in Panther Creek meadows.
Collection: 25609. Date: 24 Aug. 1949. Abundance: V, B. Associates: *Kalmia polifolia, Phyllodoce empetriformis, Abies magnifica* var. *shastensis, Tsuga mertensiana.* Distribution: On at least 28 ericaceous hosts in Europe, Asia, Japan, North and South America, Mt. Shasta.

Pucciniastrum pustulatum (Pers.) Diet. — On *Epilobium adenocaulon.* — Seen and collected only once on a colony of the host along Squaw Valley Creek below the McCloud intake. Here it had parasitized most of the plants in the colony.
Collection: 14676, Exs. 85. Date: 8 Aug. 1940. Abundance: V, C. Associates: *Abies concolor, Pseudotsuga taxifolia.*

On *Epilobium angustifolium.* — Common in the vicinity of Bear Springs in 1947.
Collection: 20473, Exs. 262. Date: 22 Aug. 1947. Abundance: IV, C.

Associates: *Abies concolor, Libocedrus decurrens.* Distribution: On at least 20 onagraceous hosts in Europe, Siberia, Japan, New Zealand, North America, Mt. Shasta.

Pucciniastrum pyrolae (Pers.) Schroet. — On *Pyrola dentata* var. *integra.* — On a large colony of this host along the Sisson Southern Trail in Shasta fir woods.
Collections: 18231, 20414. Dates: 12 July 1946, 8 Aug. 1947. Abundance: III, C. Associate: *Abies magnifica* var. *shastensis.*

On *Pyrola picta.* — On small colonies of the host in Mud Creek Canyon, in Squaw Valley Creek canyon and along the Sisson Southern Trail. Reported by Blasdale (1919) from Sisson (now Mount Shasta).
Collections: 16654, 20236, 20417. Dates: 2 July 1942, 10 July, 8 Aug. 1947. Abundance: IV, C. Associates: Conifers of the Sierra Mixed Conifer and Shasta Fir zones.

On *Chimaphila umbellata.* — Along Squaw Valley Creek at 5500 feet, and along the Sisson Southern Trail at 6000 feet. While the host is common the rust is rare.
Collections: 20241, 20416. Dates: 10 July, 8 Aug. 1947. Abundance: IV, C. Associates: Conifers of the Sierra Mixed Conifer zone and White Fir zone.

On *Ramischia secunda.* — Along the Sisson Southern Trail. Also reported by Blasdale (1919) from Sisson.
Collection: 20418. Date: 8 Aug. 1947. Abundance: V, C. Associate: *Abies concolor.* Distribution: On at least 11 pyrolaceous species in Europe, Japan, North America, Mt. Shasta.

Pucciniastrum sparsum (Wint.) Fisch. — On *Arctostaphylos nevadensis.* — Abundant on several shrubs along Squaw Valley Creek at about 6500 feet. With *Exobasidium vaccinii-uliginosii.*
Collection: 20256. Date: 10 July 1947. Abundance: IV, B. Associate: *Abies magnifica* var. *shastensis.*

On *Arctostaphylos patula.* — Seen only on the McCloud (south) side of the mountain where it was collected on each of two years in the chaparral along a road below the Squaw Valley Creek spring. It infects, and apparently kills, the leaves of an entire shrub. It was not ascertained whether this action thus kills the host or merely weakens its succeeding growth. Reported by Blasdale (1919) from Sisson, the type locality of *Uredo copelandii* Syd., a synonym.
Collections: 14683, 15762, Exs. 86. Dates: 8 Aug. 1940, 28 Aug. 1941. Abundance: IV, B. Associates: *Ceanothus velutinus, Castanopsis chrysophylla, Pinus attenuata.* Distribution: On at least five ericaceous species in Europe and Japan and from Alaska to Southern California and Mexico; Mt. Shasta.

Uredinopsis copelandii Sydow. — On *Athyrium filix-foemina* var. *californicum.* — Based on a collection made by E. B. Copeland near Sisson (Mount Shasta) near the west base of the

mountain. Found more recently at the big spring at the foot of Squaw Valley Creek canyon, and in the Wagon Camp bog.
Collections: E. B. Copeland; 20232, 2-314, Exs. 265. Dates: 13 Aug. 1903; 10, 18 July 1947. Abundance: IV, C. Associates: Conifers of the Sierra Mixed Conifer and White Fir zones. Distribution: Siskiyou and Humbolt Counties, Yosemite National Park, California; Bermuda; Mt. Shasta.

Uredinopsis macrosperma (Cke.) Magn. — On *Pteridium aquilinum* var. *pubescens.* — Found on fronds on the bluff at the foot of Squaw Valley Creek Canyon, 5000 feet. Reported from Sisson by Blasdale (1919).
Collection: 20233, Exs. 266. Date: 10 July 1947. Abundance: V, C. Associates: *Pseudotsuga taxifolia, Abies concolor.* Distribution: On at least three species of *Abies* and three species of *Pteridium* in Japan, Asia, Africa, North and South America, Mt. Shasta.

Pucciniaceae.

Aecidium graebnerianum P. Henn. — On *Habenaria leucostachys.* — Found only once in the Wagon Camp bog, 5700 ft.
Collection: 20316. Date: 18 July 1947. Abundance: V, C. Associates: *Abies* spp., *Libocedrus decurrens.* Distribution: On at least six species of *Habenaria* and one of *Orchis,* Southern Alaska to Southern California; Mt. Shasta.

Cumminsiella mirabilissima (Pk.) Nannf. — On *Berberis piperiana.* — At the one time when the colony of this host on the lava flow above Hotlum Station was visited all the leaves on a number of scattered plants were mildly infected.
Collection: 14657. Date: 27 June 1940. Abundance: V, B. Associates: *Purshia tridentata, Cercocarpus ledifolius.* Distribution: On at least seven species of *Berberis* (including *Mahonia*) in Europe, Central America, North America; Mt. Shasta.

Gymnosporangium libocedri (P. Henn.) Kern. — On *Libocedrus decurrens.* — Trees at Bear Springs were found in several seasons to have the telial stages on the leaves of at least their lower branches.
Collections: 13399, 20303, Exs. 1. Dates: 22 Aug. 1939, 18 July 1947, observed in intermediate years. Abundance: III, A. Associates: *Amelanchier pallida, Pinus jeffreyi.*

On *Amelachier pallida.* — Pycnia and aecia were observed abundantly on leaves, branches, peduncles, flowers and fruits on shrubs in the chaparral, at Bear Springs and at Widow Springs.
Collections: 8572, 8585, 14623, 16662, 18282, 20304, Exs. 37, 37-A. Dates: 9, 16 July 1937; 5 July 1940; 2 July 1942, 25 July 1946; 18 July 1947; Observed throughout each summer from 1936 to 1948 and at occasional subsequent visits. Abundance: II, B. Associates: *Libocedrus decur-*

rens, Pinus jeffreyi at Bear Springs and Widow Springs; shrubs of the chaparral at other points.

On *Crataegus douglasii.* — Infecting leaves, branches, flowers and young fruits of trees along a creek in Mount Shasta, 3550 feet. Collection: 15501. Date: 3 June 1941. Abundance: II, B. Associates: *Libocedrus decurrens, Pinus ponderosa, Abies concolor.*

Reported as *Aecidium blasdaleanum* Diet. & Holw. on *Crataegus rivularis* (a synonym of *C. douglasii*) from Shasta Springs and Sisson by Blasdale (1919). Specimens of *Gymnosporangium blasdaleanum* (Diet. & Holw.) Kern are filed in the Holway rust herbarium at the University of Minnesota.

Distribution: On at least 13 pomaceous species and *Libocedrus decurrens* in western Oregon and northern California; Mt. Shasta.

Gymnosporangium biseptatum Ell. — On *Libocedrus decurrens.* — A specimen collected at Sisson by W. C. Blasdale in Aug. 1884 was distributed in Ellis and Everhart, North American Fungi No. 3248.

Nyssopsora echinata (Lév.) Arth. — On *Ligusticum grayi.* — In the upper portions of Squaw Valley Creek, 8000—8500 feet, this fungus occurred on many leaves, stems and peduncles of the host. While the host occurs in the Squaw Valley Creek and Panther Creek basins as low as 5000 feet, infection by this pathogen has not been observed below 7500 feet.
Collections: 10297, 13384, 25615, Exs. 3. Dates: 8 Sept. 1938, 10 Aug. 1939, Aug. 1949. Abundance: III, C. Associates: *Pinus albicaulis, Tsuga mertensiana.* Distribution: On at least 11 umbelliferous species in western North America; Mt. Shasta.

Phragmidium imitans Arth. — On *Rubus leucodermis.* — Reported from Sisson and Shasta Springs on cultivated raspberry by Blasdale (1919).

Phragmidium ivesiae Syd. — On *Potentilla gracilis* ssp. *nuttallii.* — Several plants were infected along a street in Mount Shasta.
Collection: 15509, Exs. 144; Date: 16 June 1941. Abundance: V, C. Associates: Street weeds and garden plants. Distribution: On at least 24 rosaceous species west of the Mississippi in Canada and the United States; Mt. Shasta.

Phragmidium occidentale Arth. — On *Rubus parviflorus.* — Although the host is scattered through the chaparral this fungus has been found on it only in isolated instances especially along the road below the Squaw Valley Creek spring above McCloud; and along an old lane near the Mount Shasta Municipal spring, 4000 feet.
Collections: 14675, 20301, Exs. 82. Dates: 8 Aug. 1940, 18 July 1947. A specimen collected by E. B. Copeland at Sisson was distributed

by Sydow in his exsiccatum „Uredineen" No. 1789 as indicated by a collection in the Holway herbarium.

Phragmidium rosae-californicae Diet. — On *Rosa gymnocarpa.* — Occasional shrubs of the host are infected with both stem and leaf lesions.
Collections: 10159, 14679, 15504, 15683, Exs. 129-A, 129-B. Dates: 24 June 1938; 2 Aug. 1940; 7 June, 8 Aug. 1941. Abundance: III, B. Associates: *Pinus ponderosa, Arctostaphylos patula, Ceanothus velutinus.* The type of this spiecies was reported on *Rosa californica* from Sisson in Hedwigia 44: 125. 1905. Distribution: On at least eight species of *Rosa* from British Columbia to Southern California; Mt. Shasta.

Phragmidium rubi-idaei (DC.) Karst. — On *Rubus parviflorus.* — A specimen collected by W. C. Blasdale, 28 July 1894, at Sisson was distributed in Ellis and Everhart, North American Fungi. No. 3245.

Puccinia absinthii Hedw. f. — On *Artemisia tridentata.* — Found on several shrubs on the north side of the mountain near Bolam Station, 5000 ft.
Collection: 25649. Date: 26 Aug. 1949. Abundance: IV, B. Associates: *Chrysothamnus nauseosus* var. *occidentalis, Pinus ponderosa.* Distribution: On at least 36 species of Composites in Europe, Japan, Central America, Western North America.

Puccinia asarina Kunze. — On *Asarum hartwegii.* — Found on occasional plants in rocks on the north side of Cascade Gulch and along Squaw Valley Creek, 5000—6500 feet.
Collections: 20239, 20350. Dates: 10, 25 July 1947. Abundance: IV, C. Associates: Conifers of the Sierra Mixed Conifer Zone and White Fir zone.

On *Asarum lemmonii.* — Reported from Sisson by Blasdale (1919). Distribution: Siberia, Japan, Idaho to British Columbia, south to central California; Mt. Shasta.

Puccinia atrofusca (Dudl. & Thomps.) Holw. — On *Carex multicaulis.* — On colonies of the host along the Sisson Southern Trail and the Shasta Snowline Highway, 5000—5500 feet.
Collections: 18267, 20389, Exs. 289. Dates: 19 July 1946; Aug. 1947. Abundance: IV, C. Associates: *Pinus ponderosa, Libocedrus decurrens, Abies concolor.* Distribution: On at least 22 species of *Aster* and 15 of *Carex* in Asia, Siberia, Japan, western North America; Mt. Shasta.

Puccinia calochortii Pk. — On *Calochortus nudus.* — Common on a colony of the host along the Wagon Camp road between Wagon Camp and Bear Springs, 5500 feet.
Collection: 15693, Exs. 130. Date: 8 Aug. 1941. Abundance: IV, C. Associates: *Abies concolor, Pinus ponderosa.* Distribution: On at least

14 liliaceous species in Mexico and western North America; Mt. Shasta.

Puccinia caricis (Schum.) Schroet. — Collected on three different species of *Carex:*

On *Carex amplectens* once in 1939.

On *Carex kelloggii* at 5500 feet once in 1941; 15612, 25 July 1941. Exs. 131.

On *Carex whitneyi* at 4500 feet once in 1941: 15602, 25 July 1941, Exs. 132; at 6000 feet once in 1946 in White fir-Shasta fir woods: 18232, 12 July 1946; once along the Shasta Snowline Highway at 5500 feet. Abundance: III, C. Distribution: On over 100 sedges in temperate Europe, Asia, Japan, New Zealand, North America, Mt. Shasta.

Puccinia chamaesarachae Syd. — On *Chamaesaracha nana.* — Observed every year from 1936 through 1947 on the host colony at Wagon Camp as well as on one below Bear Springs, and occasionally on other colonies of the host between 4000 and 7000 feet. Collections: 8590, 10213, 13257, 13260, 20387, Exs. 4. Dates: 23 July 1937; 15 July 1938; 16 June 1939; 1 Aug. 1947. Abundance: III, C. Associates: Species of zones from Shasta fir to chaparral. Distribution: Nevada, Northern California, Mt. Shasta.

Puccinia cicutae Fosch. — On *Cicuta occidentalis.* — Reported from Sisson by Blasdale, (1919).

Puccinia circaeae Pers. — On *Circaea pacifica.* — Reported from Sisson by Blasdale (1919).

Puccinia comandrae Pk. — On *Comandra umbellata.* — Reported by Blasdale (1919) from Shasta Springs.

Puccinia crandallii Pam. & Hume. — On *Symphoricarpos,* along the lane from McCloud to the Squaw Valley Creek spring under pines at 4000 ft.

Collection: 18280. Date 25 July 1946. Abundance: IV, B. Associate: *Pinus ponderosa.* Distribution: On at least 6 species of *Symphoricarpos,* 8 of *Festuca* and two of *Poa,* Western North America, Mt. Shasta.

Puccinia cruciferearum Rud. — On *Cardamine bellidifolia* var. *pachyphylla.* — One plant in a cool, moist spot behind a lava rock at 8500 feet was weakly infected. The host occurs in such isolated locations throughout the White Bark Pine zone. The fungus has been found only once.

Collection: Collected once in 1941. Abundance: V, C. Associates: None. Distribution: On at least two species of *Cardamine* in east Greenland, British Columbia, Wyoming, Utah, California, Mt. Shasta.

Puccinia douglasii Ell. & Ev. — On *Phlox douglasii.* — On several plants on a ridge and in a basin south of Horse Camp, 7800—8000 feet.

Collections: 20293, 20497, Exs. 267. Dates: 16 July, 27 Aug. 1947.

Abundance: IV, B. Associates: *Abies magnifica* var. *shastensis, Pinus albicaulis.* Distribution: On at least 11 species of *Phlox,* New Jersey, Pennsylvania, Western North America, Mt. Shasta.

Puccinia effusa Diet. & Holw. — On *Viola lobata.* — Reported by Blasdale (1919) from Dunsmuir.

Puccinia extensicola Plowr. — On *Carex brainerdii.* — Covering a clump of this sedge in Mud Creek Canyon at about 6500 feet.

Collection: 13390, Exs. 5. Date: 10 Aug. 1939. Abundance: IV, C. Associate: *Eriogonum umbellatum* ssp. *polyanthum.* Distribution: On over 100 species of sedge in Europe, South America, Western North America; Mt. Shasta.

Puccinia extensicola var. *asteris* (Thuem.) Arth. — On *Aster occidentalis.* — Covering a colony of this host along a creek at Wagon Camp, 5700 feet.

Collection: 20422, Exs. 268. Date: 15 Aug. 1947. Abundance: IV, C. Associates: *Libocedrus decurrens, Abies* spp. Distribution: On many species of *Aster* and *Carex* in Europe, South and North America; Mt. Shasta.

Puccinia glumarum (Schmidt) Erikss. & Henn. — On *Bromus carinatus.* — Collected once in the chaparral in 1939. — Abundance: V, C. Associates: *Arctostaphylos patula, Ceanothus velutinus.*

On *Elymus glaucus.* — Collected once near Wagon Camp.

Collection: 13344. Date: 21 July 1939. Abundance: V, C. Associates: *Abies concolor, Abies magnifica* var. *shastensis.*

On *Elymus glaucus* ssp. *jepsonii.* — Collected on the only plant of the host found on the mountain. This plant, found at Bear Springs, was heavily infected.

Collection: 13344-A, Exs. 8. Date: 21 July 1939. Abundance: V, C. Associates: *Libocedrus decurrens, Pinus jeffreyi.*

On *Elymus hansenii* (*Sitanion hansenii*). — Collections: 13341, 15585, Exs. 40. Dates: 21 July 1939, 18 July 1940. Abundance: IV, C. Collected on plants in the vicinity of Wagon Camp. Associates: *Abies concolor, Abies magnifica* var. *shastensis.*

On *Elymus elymoides* (*Sitanion hystrix*). — Weak to mild infections on scattered to isolated clumps of the grass have been noted in each year at Horse Camp; found once on the north side of the mountain near Bolam Creek Canyon.

Collections: 13397, 15694. Dates: 20 Aug. 1939, 26 Aug. 1949. Abundance: III, C. Associate: *Abies magnifica* var. *shastensis.* Distribution: On at least 39 grasses in Europe, North Africa, Japan, South America, western North America; Mt. Shasta.

Puccinia grindeliae Pk. — On *Haplopappus bloomeri* var. *angustatus.* — On several shrubs in white fir-Shasta fir woods in

Cascade Gulch on the south side of the lava flow terminating at MacBride Springs, 6000 feet.
Collection: 20339, Exs. 269. Date: 25 July 1947. Abundance: IV, B. Associates: *Abies concolor, Abies magnifica* var. *shastensis.*

On *Chrysothamnus nauseosus* var. *occidentalis.* — On several shrubs near Bolam Station, 5000 feet.
Collection: 25652. Date: 26 Aug. 1949. Abundance: IV, B. Associates: *Pinus ponderosa, Artemisia tridentata.* Distribution: On more than 88 species of Compositae in western North America.

Puccinia harknessii Vize. — On *Stephanomeria lactucina.* — Occasional on the host throughout the chaparral.
Collections: 10177, 15653, 20324, Exs. 133. Dates: 1 July 1938, 31 July 1941, 18 July 1947. Abundance: III, C. Associates: *Arctostaphylos patula, Ceanothus velutinus.* Distribution: On at least 12 cichoraceous species in western North America; Mt. Shasta.

Puccinia heucherae (Schw.) Diet. — On *Mitella pentandra.* — Infection was found on one plant near a bridge across Squaw Valley Creek below the McCloud intake at 5000 feet. The host occurs throughout the Squaw Valley Creek and Panther Creek drainage basins from 8000 to below 5000 feet. The fungus has been found also on one colony along Panther Creek below the meadows.
Collections: 14677, 20447, exs. 270. Dates: 8 Aug. 1940, 15 Aug. 1947. Abundance: IV, C. Associates: *Pseudotsuga taxifolia, Abies concolor; Abies magnifica* var. *shastensis.*

On *Tellima grandiflora.* — A collection made by W. C. Blasdale at Shasta Springs, 7 Aug. 1894, is filed in the Holway herbarium. — Distribution: On at least 45 saxifragaceous hosts in Europe, Eastern Asia, Japan, North America; Mt. Shasta.

Puccinia hieracii (Schum.) Mart. — On *Agoseris grandiflora.* — On several plants in the MacBride Springs and Bear Springs areas, 5000 feet.
Collections: 15605, 18102. Dates: 25 July 1941, 28 June 1946. Abundance: III, C. Associates: *Arctostaphylos patula, Ceanothus velutinus, Purshia tridentata.*

On *Agoseris heterophylla.* — On several plants in the MacBride Springs area.
Collection: 10124. Date: 17 June 1938. Abundance: V, C. Associates: *Arctostaphylos patula, Ceanothus velutinus, Purshia tridentata.*

On *Agoseris scorzoneriaefolia.* — On two plants on a flat at 9000 feet near the One Mile Post along the Summit Trail above Horse Camp; on a number of plants scattered through colonies of the host in the open lava flats above Panther Creek Meadows.
Collections: 13356, 18406, Exs. 205. Dates: 26 July 1939, 29 Aug. 1946. Abundance: III, C. Associates: *Hieracium gracile, Eriogonum marifolium, Eriogonum pyrolaefolium.*

On *Hieracium albiflorum.* — On leaves and peduncles of plants near the Municipal Spring at Howard, and in Mud Creek Canyon. Collections: 13384, 13394, Exs. 7. Dates: 10 Aug. 1939; once in 1941. A specimen in the Holway Herbarium was obtained by Holway at Sisson, 28 May 1894. Abundance: IV, C. Associates: *Pinus ponderosa, Libocedrus decurrens, Pseudotsuga taxifolia.*

On *Hieracium gracile.* — Near the head of a dry spring in the basin above Panther Creek Meadows near the Painted Cliff. Collection: 18407, Exs. 206. Date: 29 Aug. 1946. Abundance: III, C. Associates: *Agoseris scorzoneraefolia, Juncus mertensianus.*

On *Taraxacum officinale.* — Many adventitious plants at Wagon Camp were heavily infected. Also reported by Blasdale (1919) from Sisson.
Collection: 20312. Date: 18 July 1947. Abundance: IV, C. Associates: *Abies* spp., *Libocedrus decurrens.* Distribution: On at least 60 cichoraceous species in Asia, Bermuda, Europe, Japan, Africa, Australia, New Zealand, South, Central and North America; Mt. Shasta.

Puccinia jonesii var. *cymopteri* (Diet. & Holw.) Arth. — On *Cymopterus terebinthinus.* — Common on the colony of this host on the lava flow terminating at MacBride Springs, and in the chaparral near Andesite.
Collections: 13420, 14601, Exs. 8. Dates: 25 Aug. 1939, 4 June 1940. Abundance: III, C. Associate: *Purshia tridentata.* Distribution: On at least eleven umbelliferous species from Wyoming to eastern California and New Mexico; Mt. Shasta.

Puccinia ligustici Ell. & Ev. — On *Ligusticum grayi.* — A small colony of this common host was infected along Squaw Valley Creek below the rush swale.
Collections: 13394, 13418, Exs. 41. Dates: 10, 24 Aug. 1939. Abundance: IV, C. Associates: *Phyllodoce empetriformis, Kalmia polifolia.* Distribution: On at least 18 umbelliferous species in western North America; Mt. Shasta.

Puccinia melanconioides Ell. & Holw. — On *Dodecatheon* sp. — A specimen in the Holway Herbarium was collected by Holway at Dunsmuir, 30 May 1894.

Puccinia mellifera Diet. & Holw. — On *Salvia sonomonensis.* — The host forms large mats in the chaparral in the vicinity of the Sisson Southern Trail and the Snowline Highway. Occasional mats are infected yearly although no infection was seen in 1946.
Collection: 14569, Exs. 83. Date: 19 July 1940. Abundance: III, C. Associates: *Arctostaphylos patula, Ceanothus velutinus, Quercus kelloggii.* Distribution: On at least seven species of labiates in Nevada and California; Mt. Shasta.

Puccinia menthae Pers. — On *Monardella odoratissima.* — Occasional plants of the host are infected by this fungus on different parts of the mountain in different years. The fungus causes mild spotting of the leaves to distortion of the stems and branches.
Collections: 8591, 13391, 14624, 20323, 20349, 25658, Exs. 9. Dates: 23 July 1937; 10 Aug. 1939; 5 July 1940; 18, 25 July 1947; 26 Aug. 1949. Abundance: III, C. Associates: *Abies concolor, Abies magnifica* var. *shastensis.* Distribution: On at least 50 labiates in North and South America, Europe, Africa, Asia, Japan; Mt. Shasta.

Puccinia monoica (Pk.) Arth. — On *Arabis platysperma.* — Infrequently plants of this host are found without flowers. The internodes become elongated and instead of a flower there occurs one bract on which the pustules of the rust occur. This rust has been observed only on the typical variety of the host in the Shasta fir zone although the host reaches the upper timberline as a dwarf variety.
Collections: 8576, 8613, 10254, 20330, Exs. 271. Dates: 9 July, 6 Aug. 1937; 29 July 1938; 18 July 1947. Abundance: IV, C. Associate: *Abies magnifica* var. *shastensis.*

On *Arabis* sp. — On a few plants along the McCloud River Railroad near the Snowline Highway, 4000 ft.
Collection: 19321. Date: 8 April 1947. Abundance: IV, C. Associates: *Arctostaphylos patula, Ceanothus velutinus.* Distribution: On at least 26 cruciferous species in the western United States and British Columbia; Mt. Shasta.

Puccinia oxyriae Fckl. — On *Oxyria digyna.* — While this host occurs commonly above 8000 feet in moist places sheltered under lava boulders, the fungus has been found only once and that at 10,000 feet on the west side of Shastina.
Collection: 15747, Exs. 134. Date: 21 Aug. 1941. Abundance: V, C. Associates: None. Distribution: Swedish Lappland, Norway, Sweden, Spitzbergen, King William's Land, Iceland, Fäeröes, Great Britain, Tyrol, Alpine Western North America; Mt. Shasta.

Puccinia palmeri Diet. & Holw. — On *Pentstemon menziesii* var. *davidsonii.* — While this host is common in the upper timberline region and the White Bark Pine zone this fungus has been found only once on it.
Collection: 15618. Date: 28 July 1941. Abundance: V, B. Associate: *Pinus albicaulis.*

On *Pentstemon newberryi.* — On a colony of this species growing at 5500—6000 feet in Cascade Gulch near the Sisson Southern Trail; and on the few plants growing in Shasta fir woods on the north slope of the ridge south of Horse Camp, 8000 feet.
Collections: 8680, 13387, 15718, 20295, Exs. 42. Dates: 3 Sept. 1937; 10 Aug. 1939; 15 Aug. 1941; 16 July 1947. Abundance: IV, C. Associates: *Pinus ponderosa, Abies concolor; Abies magnifica* var. *shastensis.*

Distribution: On at least 13 species of *Pentstemon* in the western United States.

Puccinia pattersoniana Arth. — On *Elymus hansenii.* — Found only once on a small colony of the host in a grove of firs below Wagon Camp.
Collection: 15690. Date: 8 Aug. 1941. Abundance: V, C. Associates: *Abies concolor, Abies magnifica* var. *shastensis.* Distribution: On at least 5 grasses in western North America; Mt. Shasta.

Puccinia pentstemonis Pk. — On *Pentstemon deustus* ssp. *deustus.* — Colonies of the host along the Sisson Southern Trail between 4500 and 5000 feet are heavily infected annually.
Collections: 10122, 10183, 10191, 10274, 20400, Exs. 10. Dates: 17 June, 8 July, 12 Aug. 1938; 8 Aug. 1947. Abundance: III, C. Associates: *Pinus ponderosa, Abies concolor, Arctostaphylos patula.* Distribution: On at least seven species of *Pentstemon* in western North America and Mexico; Mt. Shasta.

Puccinia pimpinellae (Str.) Mart. — On *Osmorhiza nuda.* — Found in 1937 at Wagon Camp on a few plants; in 1947 a heavy infection of this host was noted in the same area.
Collections: 8586, 20318, Exs. 272. Dates: 16 July 1937, 18 July 1947. Abundance: V, C. Associates: *Abies concolor, Abies magnifica* var. *shastensis.* Distribution: On at least 14 umbelliferous species in Europe, Asia Minor, India, Japan, Algeria, North America; Mt. Shasta.

Puccinia poae-sudeticae (Westd.) Jørgstd. — On *Poa pratensis.* — Occasional on this host in the vicinity of Horse Camp, 8000 ft., and Bear Springs, 5000 ft.
Collections: 10277, 15610, 15688. Dates: 19 Aug. 1938; 25 July, 8. Aug. 1941. Abundance: IV, C. Associates: *Abies magnifica* var. *shastensis; Libocedrus decurrens, Pinus jeffreyi.* Distribution: On at least 28 species of grasses in Europe, Japan, New Zealand, Central and South America, Canada, western United States, Mt. Shasta.

Puccinia pseudocymopteri Holw. — On *Cymopterus terebinthinus.* — Occasional on the colony of the host on the lava flow terminating at MacBride Springs.
Collection: 13421. Date: 25 Aug. 1939. Abundance: V, C. Associates: *Pinus ponderosa, Libocedrus decurrens, Abies concolor.* Distribution: On at least four species of „Pseudocymopterus" from Montana to New Mexico; Mt. Shasta.

Puccinia rubigo-vera (DC.) Wint. — On *Holcus lanatus.* — Completely infecting a group of plants near an irrigation ditch near Mount Shasta at 3550 feet.
Collection: 15503. Date: 7 June 1941. Abundance: II, C.

On *Trisetum spicatum.* — A number of plants near one of the springs at 8250 feet on a ridge above Horse Camp was infected.

Collections: 10285, 20440. Dates: 4 Sept. 1938, 15 Aug. 1947. Abundance: IV, C. Associates: *Mimulus tilingii, Juncus mertensianus.* Distribution: On many grasses in Europe and North America, Mt. Shasta.

Puccinia rubigo-vera var. *agropyri* (Erikss.) Arth. — On *Aquilegia formosa.* — Several plants growing on the edge of the Bear Springs meadow under incense cedars were infected in one year.

Collection: 8575. Date: 9 July 1937. Abundance: V, C. Associates: *Libocedrus decurrens, Pinus jeffreyi.*

On *Clematis ligusticifolia.* — Reported by Blasdale (1919) from Sisson. Distribution: On 35 ranunculaceous species in Europe and North America; Mt. Shasta.

Puccinia rufescens Diet. & Holw. — On *Pedicularis densiflora.* — Several colonies in the chaparral near MacBride Springs have been found infected.

Collections: 13296, 14660, 18266, Exs. 84. Dates: 30 June 1939, 19 July 1940; 19 July 1946. Abundance: IV, C. Associates: *Arctostaphylos patula, Ceanothus velutinus.* Distribution: On at least four species of *Pedicularis* in Colorado and California; Mt. Shasta.

Puccinia scandica Johanss. — On *Epilobium clavatum.* — About half of a colony of the host near a small spring above Panther Creek Meadows was completely infected and sterilized by this species.

Collection: 13359, Exs. 11. Date: 26 July 1939. Abundance: IV, C. Associates: *Mimulus tilingii, Juncus mertensianus.* Distribution: On this species, *E. anagallidifolium,* in Swedish Lappland, Northern Norway, Sweden, Finland, British Columbia, Washington, Utah California; Mt. Shasta.

Puccinia sejuncta Syd. — On *Hieracium* sp. — Reported from Sisson by Blasdale (1919).

Puccinia subdecora Syd. & Holw. — On *Brickellia grandiflora.* — Usually the lower leaves, sometimes all the leaves, on stems of this host were spotted by pustules of this rust. In the lava flow above Hotlum Station.

Collection: 15746. Date: 22 Aug. 1941. Abundance: V, C. Associates: *Sambucus glaucus, Purshia tridentata, Cercocarpus ledifolius.* Distribution: Colorado, Utah, Mt. Shasta.

Puccinia vagans (DC.) Arth. — On *Clarkia rhombifolia.* — Observed occasionally on host plants in the chaparral.

Collections: 10123, 15576. Dates: 17 June 1938, 18 July 1941. Abundance: IV, C. Associates: *Arctostaphylos patula, Ceanothus velutinus, Castanopsis chrysophylla.*

On *Epilobium ?minutum.* — A specimen collected 24 June 1937 by V. S. Brown at Mount Shasta is deposited in the herbarium

of the field office of Forest Pathology, San Francisco, No. 87585. Distribution: On at least 15 onagraceous species in Europe, Asia, Japan, Australia, New Zealand, South America, western North America; Mt. Shasta.

Puccinia vagans var. *gayophytii* Arth. — On *Gayophytum* spp. — Collected on some and observed on most of the species of this host genus on the mountain from 4000 feet to 8000 feet. In places whole colonies of annual hosts of this genus were infected. Collections: 8587, 10406, 14702, 20311, 25668, Exs. 12. Dates: 16 July 1937, 22 July 1938, 22 Aug. 1940, 18 July 1947, 26. Aug. 1949. Abundance: IV, C. Associates: *Abies magnifica* var. *shastensis; Ceanothus velutinus, Arctostaphylos patula.*

On *Gayophytum diffusum.* — Reported by Blasdale (1919) from Sisson. Distribution: On 7 species of *Gayophytum* in western North America; Mt. Shasta.

Puccinia veratri Niessl. — On *Veratrum californicum.* — A specimen collected by W. C. Blasdale at Sisson, 1 July 1894, was distributed in the Sydow exsiccatum „Uredineen" No. 1386. Noted in the Holway Herbarium.

Puccinia violae (Schum.) DC. — On *Viola adunca.* — Reported by Blasdale (1919) from Sisson.

Uromyces amoenus Syd. — On *Anaphalis margaritacea.* — The host has been found only in Mud Creek Canyon and here this rust occurs on scattered plants between 6500 and 8000 feet. Collection: 14704, Exs. 87. Date: 22 Aug. 1940. Abundance: IV, C. Associates: *Abies concolor, Abies magnifica* var. *shastensis.* Distribution: On *Anaphalis* species in western North America; Mt. Shasta.

Uromyces aterrimus Diet. & Holw. — On *Allium validum.* — A specimen collected Aug. 1894 at the base of Mt. Shasta by W. C. Blasdale was distributed in Ellis and Everhart, North American Fungi 3344, Fungi Columbiani No. 861.

Uromyces aureus Diet. & Holw. — On *Allium validum.* — Common wherever the host occurs on the mountain: in Panther Creek Meadows, Squaw Valley Creek meadows, Wagon Camp, and hanging gardens of Mud Creek Canyon. Reported by Blasdale (1919) from Sisson.
Collections: 8582, 8614, 10257, 13412, 18403, 20328, Exs. 15. Dates: 16 July, 6. Aug. 1937; 29 July 1938; 24 Aug. 1939; 29 Aug. 1946; 18 July 1947. Abundance: II, C. Associates: *Phyllodoce empetriformis, Kalmia polifolia.* Distribution: On at least two liliaceous species in northern California; Mt. Shasta.

Uromyces fabae (Pers.) d. By. — Occasional colonies of *Vicia americana* and *Lathyrus lanzswertii* var. *aridus* were heavily infected with this rust in the MacBride Springs and Wagon Camp areas. and in the chaparral along the Shasta Snowline Highway.

Collections: 13345, 15606, 15611, 19292, 20306, Exs. 140. Dates: 21 July 1939; 25 July 1941; 7 Apr., 18 July 1947. Abundance: III, C. Associates: *Abies concolor, Abies magnifica* var. *shastensis, Libocedrus decurrens; Arctostaphylos patula.* Distribution: On 36 leguminous species in North America; Mt. Shasta; Cosmopolitan.

Uromyces holwayi Lagh. — On *Lilium columbianum.* — A specimen collected by W. C. Blasdale at Sisson in July, 1894, was distributed in Ellis and Everhart, North American Fungi, Second Series, No. 3241, represented in the Holway Herbarium.

Uromyces hyperici (Spreng.) Curt. — On *Hypericum perforatum.* — The only colony of this host found on the mountain, in a small meadow near a railroad fill at Howard, was mildly infected with this rust.
Collections: 15682, Exs. 141. Date: 8 Aug. 1941. Abundance: V, C. Associates: *Arctostaphylos patula, Pinus ponderosa, Pseudotsuga taxifolia.* Distribution: On 16 hypericaceous species in Formosa, South America, Mexico, North America; Mt. Shasta.

Uromyces intricatus Cke. — On *Eriogonum latifolium* ssp. *nudum.* — Occasional on this species throughout the chaparral especially along the Sisson Southern Trail on leaves and peduncles.
Collections: 8583, 13382, 14723, Exs. 89. Dates: 16 July 1937, 10 Aug. 1939, 15 Sept. 1940. Abundance: III, C. Associates: *Arctostaphylos patula, Ceanothus velutinus, Castanopsis chrysophylla.*

On *Eriogonum marifolium.* — Occasional on plants in lava flats in the Horse Camp area.
Collections: 13322, 13409, 20222, 20457, Exs. 17. Dates: 7 July, 22. Aug. 1939; 2 July, 15 Aug. 1947. Abundance: III, C. Associates: *Polygonum shastense, Haplopappus bloomeri* var. *angustatus, Lupinus obtusilobus.*

On *Eriogonum umbellatum* ssp. *polyanthum.* — Several plants in Mud Creek Canyon had complete infection on leaves, stems and peduncles caused by this rust; the colony on the north side of the mountain was apparently uninfected when observed in 1938, but a collection was made from it in 1949. Collections: 14710, 25697, Exs. 88. Dates: 22 Aug. 1940, 26 Aug. 1949. Abundance: III, C. Associates: *Pinus ponderosa, Abies concolor.* Distribution: On at least 43 polygonaceous species in western North America; Mt. Shasta.

Uromyces junci (Desm.) L. Tul. — On *Juncus parryi.* — Occasional clumps of the host in the Horse Camp area show mild infection on culms.
Collection: 13389, Exs. 89-A. Date: 10 Aug. 1939. Abundance: V, C. Associate: *Abies magnifica* var. *shastensis.* Distribution: On at least 9 rushes in Europe, Central America, Mexico, North America; Mt. Shasta.

Uromyces lilii Clinton. — On *Lilium columbianum.* — A specimen collected by J. J. Davis at Sisson, July 1894, was distributed by Ellis and Everhart in North American Fungi, No. 3241.

Uromyces occidentalis Dietel. — On *Lupinus latifolius.* — A record was reported by Dietel in Hedwigia, Beibl. *42*: 98. 1903, from Sisson.

Uromyces pröeminens (DC.) Pass. var. *pröeminens.* — On *Euphorbia crenulata.* — Only two of the few host plants sporadically occuring along the new Shasta Snowline Higway have been found infected.

Collection: 14658, Date: 19 July 1940. Abundance: IV, C. Associates: *Arctostaphylos patula, Ceanothus velutinus.*

On *Euphorbia serpyllifolia.* — On a colony of this host along the Shasta Snowline Highway in the new pine plantation at about 4000 feet.

Collection: 20393, Exs. 274. Date: 1 Aug. 1947. Abundance: IV, C. Associates: *Arctostaphylos patula, Ceanothus velutinus.* Distribution: On a number of euphorbiaceous hosts in North America; Mt. Shasta.

Uromyces spragueae Harkn. — On *Calyptridium umbellatum* var. *caudicifera.* — Occasional colonies or individuals on lava flats and openings in the upper Shasta fir zone and timberline area were completely infected; from 8000—9500 feet. Typical material at lower elevations has not been found infected.

Collections: 13327, 13358, 13395, 18404, 20311, 20424, Exs. 18. Dates: 13, 26 July, 19 Aug. 1939; 29 Aug. 1946; 18 July, 15 Aug. 1947. Abundance: III, C. Associates: *Abies magnifica* var. *shastensis, Pinus albicaulis.* Distribution: On three species of this genus in Wyoming, Oregon, California; Mt. Shasta.

Ustilaginales.

Tilletiaceae.

Entyloma compositarum Farl. — On *Hieracium cynoglossoides* var. *nudicaule.* — On a colony along the Squaw Valley Creek spring road at 4000 feet in the chaparral north of McCloud.

Collection: 20230, Exs. 267. Date: 10 July 1947. Abundance: IV, C. Associates: *Arctostaphylos patula, Ceanothus velutinus.* Distribution: On more than 22 different species of Compositae, Europe, North America; Mt. Shasta.

Urocystis agropyri (Preuss) Schroet. — On *Elymus glaucus.* — Six leaves on one clump of the host were found infected below Wagon Camp. The area was heavily grazed by migrant herds of sheep. A number of plants were found to be infected in Wagon Camp meadow two years after grazing was discontinued.

Collections: 13401, 20313, Exs. 261. Dates: 22 Aug. 1939, 18 July 1947. Abundance: V, C. Associates: *Abies concolor, Abies magnifica* var.

shastensis, Libocedrus decurrens. Distribution: On more than 11 grasses in Europe and North America; Mt. Shasta.

Urocystis sorosporioides Koern. — On *Anemone occidentalis.* — While the host has been found commonly in the timberline region, and observed in all stages of growth, throughout the southwest quadrant of the mountain this fungus has been found only once on a colony of the host in the Shasta Fir zone near an old trail on the west wall of Mud Creek Canyon.
Collection: 14707, Exs. 80. Date: 22 Aug. 1940. Abundance: 1V, C. Associates: *Tsuga mertensiana, Abies magnifica* var. *shastensis.* Distribution: On at least 10 ranunculaceous species in Greenland, Europe, Massachusetts, Utah, Arizona, California; Mt. Shasta.

Ustilaginaceae.

Cintractia caricis (Pers.) Magn. — On *Carex multicaulis.* — This host is common in open Shasta fir woods on slopes but was found infected with this smut prior to 1949 only on the west wall of Mud Creek Canyon; in 1949 this smut was found on several clumps near Squaw Valley Creek Meadows.
Collections: 13393, 14708, 25636, Exs. 64, 64-A. Dates: 16 Aug. 1939, 22 Aug. 1940, 24 Aug. 1949. Abundance: III, C. Associates: *Abies magnifica* var. *shastensis, Tsuga mertensiana.*

On *Carex nigricans.* — This host is common in the higher springs in the Panther Creek and Squaw Valley Creek basins but the fungus occurs on it infrequently.
Collection: 14705, Exs. 79. Date: 22 Aug. 1940. Abundance: 1V, C. Associates: *Carex spectabilis, Mimulus tilingii.*

On *Carex spectabilis.* — The host is common around all springs in the higher Panther Creek and Squaw Valley Creek basins. This fungus is very common on it in all locations.
Collections: 13329, 13357, 18408, 25597, Exs. 65. Dates: 13, 26 July 1939; 29 Aug. 1946, 24 Aug. 1949; observed in each summer between 1936 and 1947. Abundance: I, C. Associates: *Carex nigricans, Mimulus tilingii.* Distribution: On more than 50 cyperaceous species wherever *Carex* grows; Mt. Shasta.

Cintractia externa (Griff.) Clint. — On *Carex spectabilis.* — Collected once at the South Gate springs.
Collection: One collection in 1937. Abundance: V, C. Associates: *Carex nigricans, Mimulus tilingii.* Distribution: On two carices in Montana, Nebraska, Wyoming; Mt. Shasta.

Ustilago bullata Berk. — On *Bromus carinatus.* — Common on most of the host plants in the chaparral near the Sisson Southern Trail at MacBride Springs.
Collections: 13298, 13343, 13386, Exs. 43. Dates: 30 June, 21, 27 July

1939. Abundance: III, C. Associates: *Arctostaphylos patula, Ceanothus velutinus, Castanopsis chrysophylla, Purshia tridentata.*

On *Bromus tectorum.* — One colony in the chaparral at 4500 feet was heavily infected.
Collections: 15608, 18367, Exs. 142. Dates: 25 July 1941, 16 Aug. 1946. Abundance: III, C. Associates: *Arctostaphylos patula, Ceanothus velutinus.* Distribution: On at least 20 species of *Bromus* in Europe, Asia, Australia, South America, District of Columbia, western North America; Mt. Shasta.

Ustilago shastense Zundel. — On *Polygonum shastense.* — This shrubby *Polygonum* forms mats on open lava fields in the White Bark Pine and upper Shasta Fir zones. Occasionally the flowers in whole plants are infected by this smut. When this occurs the usually cream to scarlet flowers are turned brown.
Collections: 13381, 18428, 20468, 27017, Exs. 63. Dates: 8 Aug. 1939, 2 Sept. 1946, 20 Aug. 1947, 28 Sept. 1950. Observed in late season weeks in all years throughout the range of the host on the mountain. Abundance: III, B. Associate: *Eriogonum marifolium.* Distribution: Known only from these localities. And a recent collection from 8500 ft. on Lassen Peak.

Ustilago spegazzinii var. *agresti* (Syd.) G. W. Fisch. & Hirsch. — On *Elymus hansenii.* — Seen only in the vicinity of Wagon Camp.
Collections: 13342, 18104, Exs. 58. Dates: 21 July 1939, 28 June 1946. Abundance: IV, C. Associates: *Abies concolor, Abies magnifica* var. *shastensis.*

On *Elymus elymoides.* — Common on occasional clumps of this grass in the vicinity of Horse Camp.
Collections: 10300, 13396, 18432, Exs. 59, 62. Dates: 20 Aug. 1939, 17 Sept. 1938, 2 Sept. 1946. Abundance: III, C. Associate: *Abies magnifica* var. *shastensis.*

On *Stipa californica.* — Common on occasional clumps of this grass in the vicinity of Horse Camp and in the timberline area on the east side of Bolam Creek Canyon.
Collections: 10302, 18362, 18429, 25696, Exs. 60. Dates: 17 Sept. 1938; 16 Aug., 2 Sept. 1946; 26 Aug. 1949. Abundance: III, C. Associate: *Abies magnifica* var. *shastensis.* Distribution: On at least 22 grass hosts in Asia, North Africa, Europe, South and North America; Mt. Shasta.

Ustilago striaeformis (West.) Niessl. — On *Elymus glaucus.* — Found once in the dry meadow at MacBride Springs.
Collection: 20184. Date: 27 June 1947. Abundance: IV, C. Associates: *Abies concolor, Libocedrus decurrens.* Distribution: On many species of grasses in Europe, North America; Mt. Shasta.

Ustilago violacea (Pers.) Fckl. — On *Silene grayi.* — Occasional in anthers of the host on lava flats and slopes near Horse Camp, at the head of Cascade Gulch at 9500 feet, and above Panther Creek meadows at 8000—9000 feet.
Collections: 16793, 18377, Exs. 155, 155-A. Dates: 8 Sept. 1942, 26 Aug. 1946. Also observed in the summers from 1936 through 1947 on plants throughout the timberline region at Horse Camp. Abundance: III, C. Associates: *Carex breweri, Eriogonum pyrolaefolium, Eriogonum marifolium, Juncus parryi.*

On *Silene douglasii.* — On the north side of the mountain along a lane above Bolam Station between 6000 and 8000 feet.
Collection: 25683. Date: 26 Aug. 1949. Abundance: III, C. Associates: *Pinus ponderosa, Abies magnifica* var. *shastensis.* Distribution: On alt least 10 species of Caryophyllaceae in Asia, Africa, Europe, Greenland, South and North America; Mt. Shasta.

Ustilago williamsii (Griff.) Lavrov. — On *Stipa occidentalis.* — On occasional plants along the Horse Camp-Wagon Camp Trail above Wagon Camp.
Collection: 13406, Exs. 61. Date: 22 Aug. 1939. Abundance: IV, C. Associate: *Abies magnifica* var. *shastensis.* Distribution: On at least 14 grasses in Argentina and the western United States; Mt. Shasta.

Tremellales.

Tulasnellaceae.

Tulasnella fuscoviolacea Bres. — On rotten Shasta fir wood. Possibly it is more common than this one collection indicates, and other species of this, as well as other resupinate tremellaceous fungi may occur on the mountain.
Collection: 10125. Date: 20 June 1938. Abundance: V, A. Associate: *Abies magnifica* var. *shastensis.* Distribution: Europe, North America; Mt. Shasta.

Tulasnella sp. — On *Abies magnifica* var. *shastensis.* — On rotten wood in the vicinity of Horse Camp.
Collections: 18139, 18140. Date: 30 June 1946. Abundance: IV, A. Associate: The host.

Dacrymycetaceae.

Dacrymyces deliquescens (Bull.) d. By. — On *Abies magnifica* var. *shastensis.* — Common on logs, branches, twigs and hand hewn boards of Shasta fir throughout the Shasta Fir zone. The imperfect stage is less frequent than the perfect.
Collections: 8513, 14619, 14645, 15556, 18041, 20365. Dates: 19 June 1937; 3, 8 June 1940; 16 July 1941; 24 June, 4 Sept. 1946; 29 July 1947. Seen at other times in every year but only large colonies of fructifications taken. Abundance: II, A. Associate: The host.

On *Arctostaphylos patula.* — In chaparral along the Sisson Southern Trail, 4000—4500 feet.
Collections: 19308, 19318. Date: 7 April 1947. Abundance: V, B. Associates: *Ceanothus velutinus, Castanopsis chrysophylla.*

On *Cercocarpus ledifolius* Nutt. — On dead wood near Andesite Station, 5000 feet, north side of the mountain.
Collection: 19402. Date: 9 April 1947. Abundance: V, B. Associates: *Purshia tridentata, Arctostaphylos patula.*

On *Libocedrus decurrens.* — On rotten wood along the Sisson Southern Trail in the chaparral.
Collection: 19306. Date: 7 April 1947. Abundance: IV, A. Associates: *Arctostaphylos patula, Ceanothus velutinus, Pinus ponderosa.*

On *Pinus attenuata.* — On dead wood along the Mud Creek Dam Road at 4000 feet about a mile north of McCloud.
Collection: 19342, 19343. Date: 9 April 1947. Abundance: IV, A. Associates: *Libocedrus decurrens, Arctostaphylos patula.*

On *Pinus ponderosa.* — On dead wood along the Sisson Southern Trail in the chaparral between 4000 and 4500 feet, and along the Mud Creek Dam Road, a mile north of McCloud at 4000 feet.
Collections: 19302, 19331, 19340. Dates: 7, 8 April 1947. Abundance: IV, A. Associates: *Abies concolor, Arctostaphylos patula.*

On *Purshia tridentata.* — On dead sticks a mile north of Andesite Station on the north side of the mountain at about 5000 feet.
Collection: 19410. Date: 9 April 1947. Abundance: V B. Associates: *Cercocarpus ledifolius, Arctostaphylos patula.*

On *Quercus chrysolepis.* — On dead wood around the base of a shrub on the lava flows along U.S. 97 about 5 miles northeast of Weed on the north side of the mountain.
Collections: 19418, 19420. Date: 9 April 1947. Abundance: V, B. Associates: Isolated shrubs in the lava blocks.

On *Quercus kelloggii* Newb. — On rotten wood along the Squaw Valley Creek road above McCloud between 4000 and 4500 feet, south side of the mountain. Among the Sisson Southern Trail in the chaparral, 4500 feet.
Collections: 18292, 19311. Dates: 25 July 1946, 7 April 1947. Abundance: IV. B. Associates: *Arctostaphylos patula, Ceanothus velutinus;* also *Pinus ponderosa* in the first habitat. Distribution: Cosmopolitan, chiefly on coniferous wood; Mt. Shasta.

Dacrymyces palmatus (Schw.) Bres. — On *Pinus ponderosa.* — On dead wood along the Mud Creek Dam road at about 4000 feet, north of McCloud on the south side of the mountain.
Collection: 19331. Date: 8 April 1947. Abundance: V, A. Associates: *Abies concolor, Libocedrus decurrens.* Distribution: North America; Mt. Shasta.

Guepiniopsis alpina (Tr. & Earle) Brasfield. — The commonest saprobic fungus on the mountain. It occurs on all forms of dead wood of Shasta fir at all elevations, as well as on dead wood of white bark pine, white fir and montain hemlock, and on boards of ponderosa pine. After light rains in the summer at Horse Camp large numbers of fruit bodies become evident on logs, branches, twigs, hand hewn boards and structural timbers.
Collections: On Shasta fir: 7575, 7627, 8522, 8533, 8541, 10128, 10292, 13319, 18024, 18144, 18349, 18443, 20130, 20380, 28277, Exs. 50. Also observed throughout each season from 1936 to 1947. On *Pinus albicaulis:* 8598. On *Tsuga mertensiana:* 8653, 10291, 15631, 25624, 28322. On *Abies concolor:* 16634. On *Pinus ponderosa* boards at Horse Camp: 18196. Dates: 8 Aug., 1 Sept. 1936; 22, 27, 29 June, 28 July, 17 Aug. 1937; 20 June, 8 Sept. 1938; 5 July 1939; 28 July 1941; 30 May 1942; 23 June, 2, 8 July, 10 Aug., 4 Sept. 1946; 25 June, 29 July 1947; 24 Aug. 1949; 3, 4 July 1951. Abundance: I, A. Associates: Conifers of the zones above the Sierra Mixed Conifer zone. Distribution: Western North America; Mt. Shasta.

Tremellaceae.

Pseudohydnum gelatinosum (Fr.) Karst. — In 1939, 1946 and 1947 several rotten Shasta fir logs near Horse Camp, partially sunken in the ground and thus kept partially moist were pulled apart in search for hypogaeous fungi. This species was found inside some of these logs. Only a few small fruit bodies were found at each time.
Collections: 13267, 13310, 13370, 18079, 20363, 26991, 28272. Dates: 28 June, 5, 31 July 1939; 27 June, 31 July 1946; 27 July 1947; 28 Sept. 1950; 3 July 1951. Abundance: IV, A. Associate: *Abies magnifica* var. *shastensis.* Distribution: Cosmopolitan on coniferous substrata; Mt. Shasta.

Tremella mesenterica (S. F. Gray) Pers. — On *Quercus kelloggii.* — Found once on dead wood on shrubs in the chaparral along the Sisson Southern Trail at about 4000 feet.
Collection: 19315. Date: 7 April 1947. Abundance: V, B. Associates: *Arctostaphylos patula, Ceanothus velutinus.* Distribution: Europe, Central and North America; Mt. Shasta.

Auriculariaceae.

Auricularia auricularis (S. F. Gray) G. W. Martin. — On *Acer glabrum, Abies concolor.* — In 1936 one collection was made on sticks of a frondose species, tentatively assigned to *Acer glabrum,* near the Sisson Southern Trail spring, 6500 feet. In 1947 it was found to be common on a fir log at the base of the zig-zag on this trail at 5000 feet.

Collections: 7606, 19380, Exs. 229. Dates: 25 Aug. 1936, 9 April 1947. Abundance: V, B; IV, A. Associates: *Acer glabrum, Prunus emarginata, Arctostaphylos nevadensis, Abies concolor, Abies magnifica* var. *shastensis; Pseudotsuga taxifolia, Pinus ponderosa, Libocedrus decurrens.* Distribution: Throughout North America and Europe on frondose and coniferous wood; Mt. Shasta.

Homobasidiomycetes.

Exobasidiales.

Exobasidiaceae.

Exobasidium vaccinii (Fckl.) Wor. — On *Arctostaphylos nevadensis.* — Infrequent on this common shrub at the lower limits of its range. At 6000 feet in a valley along the Sisson Southern Trail and at 5000 feet in Mud Creek Canyon.
Collection: 13383. Date: 10 Aug. 1939. Abundance: IV, B. Associates: *Abies concolor, Abies magnifica* var. *shastensis, Pinus ponderosa, Pinus lambertiana, Psedotsuga taxifolia.*

On *Vacinium caespitosum.* — Found once on at stunted plant with *Pucciniastrum goeppertianum* at Panther Creek Meadows.
Collection: 25619. Date: 24 Aug. 1949. Abundance: V, B. Associates: *Phyllodoce empetriformis, Kalmia polifolia.* Distribution: Siberia, Europe, North America; Mt. Shasta.

Exobasidium vaccinii-uliginosii Bond. — On *Arctostaphylos nevadensis.* — Until 1947 this disease was found infrequently on this host at the lower limits of its range, 5000—7500 feet. In 1947 this disease was very abundant on this host throughout its range except in the White Bark Pine zone where it was infrequent.
Collections: 10235, 13297, 13340, 13388, 16791, 18363, 20334, 20338, 20255, 20294, Exs. 202. Dates: 25 July 1938; 30 June, 14 July, 10 Aug. 1939; 7 Sept. 1942; 16 Aug. 1946; 10, 16, 18, 25 July 1947. Abundance: IV, B; II, B. Associates: Conifers of all zones.

On *Arctostaphylos patula.* — Common on occasional shrubs throughout the chaparral. In good years infected areas present a reddish color because of the abundance of this species.
Collections: 8609, 10234, 13365, 15580, 18365, 20300, 26987, Exs. 24. Dates: 30 July 1937; 22 July 1938; 28 July 1939; 18 July 1941; 16 Aug. 1946; 18 July 1947; 28 Sept. 1950. Abundance: II, B. Associates: *Castanopsis chrysophylla, Ceanothus velutinus.* Distribution: Norway, Washington, Oregon, California; Mt. Shasta.

Polyporales.

Cyphellaceae.

Solenia ochracea (Pers.) Fr. — Collected once by W. C. Blasdale on rotten wood at Sisson's, now Mount Shasta, Siskiyou

Co., Calif. It was distributed as No. 292 in his "Fungi of California" Duplicates have been seen from the New York Botanical Garden Herbarium and from the Herbarium of the University of California, No. 671015, under the name of *Solenia stipitata* (Pers.) Fckl. Collected 30 July 1894. Distribution: Europe, North America; Mt. Shasta.

Solenia anomala (Pers. ex Fr.) Fckl. — On *Salix scouleriana.* — On bark of branches killed by oyster scale at MacBride Springs.
Collection: 26794. Date: 1 July 1950. Abundance: V, B. Associates: *Libocedrus decurrens, Pinus ponderosa, Ceanothus velutinus.* Distribution: Europe, North America; Mt. Shasta.

Solenia candida Pers. ex Fr. — On *Abies concolor, Abies magnifica* var. *shastensis, Libocedrus decurrens.* — Common on rotting wood in rotting logs in the Horse Camp area and along the Mud Creek Dam road above McCloud, 4000, 8000 feet.
Collections: 13265, 13272, 19298, 20218, Exs. 44. Dates: 26 June 1939; 7, 9 April, 1 July 1947. Abundance: III, A. Associates: Conifers of the Shasta Fir and Sierra Mixed Conifer zones. Distribution: Europe, North America; Mt. Shasta.

Thelephoraceae.

Aleurodiscus amorphus (Pers.) Rab. ex Cke. — On *Abies concolor, Abies magnifica* var. *shastensis.* — On the under side of branches and twigs still on trees between 6000 and 7000 feet in woods near the Shasta Snowline Highway, and at 4000 feet along the Mud Creek Dam road.
Collections: 15614, 15655, 15720, 19334, Exs. 116. Dates: 25, 31 July, 18 Aug. 1941; 8 April 1947. Abundance: III, A. Associates: The host species in the first habitat; *Pinus ponderosa* and *Libocedrus decurrens* in the second. Distribution: Europe, North America; Mt. Shasta.

Aleurodiscus diffisus (Sacc.) Burt. — On *Arctostaphylos nevadensis.* — Common on dead branches on a ridge below Horse Camp at about 7600 feet in the Shasta Fir zone.
Collections: 15589, 15638, 16660, 18187, Exs. 117. Dates: 19, 26 July 1941; 3 July 1942; 8 July 1946. Abundance: III, B. Associate: *Abies magnifica* var. *shastensis.*

On *Arctostaphylos patula.* — On several dead sticks in the chaparral along the Junction Road between the Snowline Highway and Wagon Camp at 6000 feet in the lower Shasta Fir zone.
Collection: 15733. Date: 18 Aug. 1941. Abundance: V, B. Associates: *Ceanothus velutinus, Castanopsis chrysophylla.* Distribution: Only on ericaceous shrubs in Manchuria, Siberia, Oregon, Lassen Peak, Mt. Shasta.

Aleurodiscus fruticetorum W. B. Cke. — On *Ceanothus velutinus, Arctostaphylos patula.* — On dead sticks of shrubs

along the Junction Road between Wagon Camp and the Snowline Highway at 6000 feet, and on dead branches of snow brush on the lava flow on the north bank of Cascade Gulch at about 6000 feet.
Collections: 15717, 15730, 15731, 15732, 15737, 20340. Dates: 15, 18 Aug. 1941; 25 July 1947. Abundances: IV, B. Associates: *Castanopsis chrysophylla,* both *Abies* species. Distribution: Known only from these collections.

Aleurodiscus roseus (Pers. ex Fr.) Hoehn. & Litsch. — Material assigned to this complex has been collected on Shasta fir, *Arctostaphylos patula* and *Quercus kelloggii* wood.
Collections: Collected once in 1939; 19307, 19312, 19316. Dates: 1939; 7 April 1947. Abundance: IV, A, B. Associates: Plants of Shasta Fir zone and chaparral associations. Distribution: Europe, North America; Mt. Shasta.

Corticium bicolor Pk. — On rotten Shasta fir wood between Panther Creek meadows and Wagon Camp.
Collection: 20488. Date: 15 Aug. 1947. Abundance: V, A. Associate: *Abies magnifica* var. *shastensis.*

Corticium ?centrifiguum Auctt. — On *Pinus ponderosa.* — On twigs along the Mud Creek Dam road, 4000 feet.
Collection: 19330. Date: 7 April 1947. Abundance: V, A. Associates: *Abies concolor, Libocedrus decurrens.* Distribution: Europe, Jamaica, North America; Mt. Shasta.

Corticium corruge (Burt) Burt in sched., in Rogers & Jackson. — On *Abies magnifica* var. *shastensis, Sambucus racemosus, Tsuga mertensiana.* — On bark of trees, logs, sticks and litter in the Horse Camp and Squaw Valley Creek areas, 8000 ft. The Horse Camp area on Mount Shasta or the Wodanthal area on Mt. Adams is the type locality. — This species was collected by E. B. Copeland on Mt. Shasta and distributed in Baker's "Fungi of the Pacific Slope".
Collections: Copeland; 18142, 18444, 20227, 24045, 24060, 25626, 28311. Dates: 1903; 2 July, 4 Sept. 1946; 10 July 1947; 3, 4 July 1948; 24 Aug. 1949; 5 July 1951. Abundance: III, A, B. Associates: *Abies magnifica* var. *shastensis, Tsuga mertensiana.* Distribution: Western United States; Mt. Shasta

Corticium cremoricolor B. & C. — Collected on rotten Shasta fir wood near Horse Camp.
Collection: One collection in 1937. Abundance: V, A. Associate: The host. Distribution: North America; Mt. Shasta.

Corticium galactinum Fr. ?. — On rotten Shasta fir wood near Horse Camp and at Sand Flats.
Colelctions: 18070, 18137, 20358, ?24052. Dates: 26, 30 June 1946; 29 July 1947; 4 July 1948. Abundance: IV, A. Associate: The host. Distribution: North America, Puerto Rico, Cuba, Japan; Mt. Shasta.

Corticium luridum Bres. — On rotten Shasta fir wood at Horse Camp, 8000 ft.
Collections: 20362, 20373, 20382. Date: 29 July 1947. Abundance: IV, A. Associate: The host. Distribution: Italy, Manitoba, Ohio, Mt. Shasta.

Corticium pelliculare? Karst. — On *Pinus ponderosa* Dougl. — On needles in litter along the Sisson Southern Trail, 4500 feet.
Collection: 19295. Date: 7 April 1947. Abundance: V, A. Associates: *Arctostaphylos patula, Ceanothus velutinus.* Distribution: Finland, Sweden, Bermuda, North America; Mt. Shasta.

Corticium radiosum Fr. — On rotten Shasta fir wood near Horse Camp, 8000 feet.
Collections: 18058, 18134, 20061, 20104, 20381. Dates: 25, 30 June 1946; 22, 23 June, 29 July 1947. Abundance: III, A. Associate: The host. Distribution: Europe, North America; Mt. Shasta.

Corticium sp. — On *Cercocarpus ledifolius, Quercus chrysolepsis, Quercus kelloggii.* — On rotten wood in chaparral areas.
Collections: 19299, 19398, 19421, 19422. Dates: 7, 9 April 1947. Abundance: IV, B. Associates: Chaparral species.

Corticium sp. — On rotten Shasta fir wood at Horse Camp.
Collection: 20366. Date: 29 July 1947. Abundance: V, A. Associate: The host.

Corticium sp. — On *Quercus kelloggii* Newb. — On rotten wood along the road to Squaw Valley Creek Spring.
Collection: 18288. Date: 25 July 1946. Abundance: V, B. Associates: *Pinus attenuata, P. ponderosa.*

Corticium sp. — On *Arctostaphylos patula, Cercocarpus ledifolius.* — On rotten branches in the chaparral.
Collections: 19309, 19400. Dates: 7, 9 April 1947. Abundance: IV, B. Associates: Shrubs of the chaparral.

Corticium sp. — On rotten Shasta fir wood near Horse Camp, 7800 feet.
Collections: 18059, 18211. Dates: 25 June, 10 July 1946. Abundance: IV, A. Associate: The host.

Corticium sp. — On rotten Shasta fir wood at Horse Camp. Panther Creek.
Collection: 18329. Date: 31 July 1946. Abundance: V, A. Associate: The host.

Corticium sp. — On rotten wood of Shasta fir at Horse Camp,
Collections: 20082, 20458. Dates: 28 June, 15 Aug. 1947. Abundance: IV, A. Associate: *Abies magnifica* var. *shastensis.*

Corticium sp. — On rotten Shasta fir wood at Horse Camp.
Collection: 24066. Date: 4 July 1948. Abundance: V, A. Associate: The host.

Corticium sp. — On rotten Shasta fir wood at Panther Creek meadows, 7500 feet.
Collection: 24066. Date: 4 July 1948. Abundance: V, A. Associate: The host.

Cytidia stereoides W. B. Cke. — On *Ceanothus velutinus, Cercocarpus ledifolius, Quercus kelloggii, Purshia tridentata.* — Scattered throughout the chaparral between 4000 and 5000 feet on dead wood of various shrubs on the west and north sides of the mountain. Collections: 18285, 18341, 19329, 19395, 19411. Dates: 25 July, 2 Aug. 1941; 7, 9 April 1947. Abundance: IV, B. Associates: Chaparral shrubs. Distribution: Known only from the listed collections.

Hymenochaete spreta Pk. — On *Ceanothus velutinus.* — On rotting branches of shrubs smother out by *Abies concolor,* along the Sisson Southern Trail, 6500 feet.
Collection: 26989. Date: 28 Sept. 1950. Abundance: IV, B. Associate: *Abies concolor.* Distribution: North America; Mt. Shasta.

Hymenochaete tabacina [(Sow.) ex Fr.] Lév. — On *Ceanothus velutinus.* — Chaparral shrubs apparently advanced up the mountain in areas which had been cut over or burned off. A these areas become reseeded with white fir and the firs reach 10—30 feet or more in height they smother these chaparral shrubs. The branches of several such smothered shrubs were found to be covered with this species, 5000—6500 feet.
Collections: 15519, 18098, 18099. Exs. 122. Dates: 27 June 1941; 28 June 1946. Abundance: III, B. Associate: *Abies concolor, Pinus ponderosa.*

On *Arctostaphylos patula.* — On dead branches in the chaparral, along the Mud Creek Dam road.
Collection: 19345. Date: 8 April 1947. Abundance: V, B. Associates: *Pinus ponderosa, Abies concolor.*

On *Castanopsis chrysophylla.* — On dead branches along the Sisson Southern Trail, 5000 feet.
Collection: 20402. Date: 8 Aug. 1947. Abundance: V, B. Associates: *Pinus ponderosa, Abies concolor, Pseudotsuga taxifolia.* Distribution: Europe, southern South America, North America; Mt. Shasta.

Pellicularia flavescens (Bon.) Rogers. — Collected on rotten Shasta fir wood at Horse Camp once in 1937. Abundance: V, A. Associate: The host. Distribution: Germany, Austria, Poland, Eastern Canada, New England, Florida, Iowa, Missouri; Mt. Shasta.

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*) The above collections of *Corticium* were submitted for identification to Dr. Jackson before his death. Each group of collections had been assigned a separate designation in reporting on the sendings. The same is true for the records of *Peniophora* which follow. As his students complete studies of this material it is being reported on in the literature.

Pellicularia subcoronata (Hoehn. & Litsch.) Rogers. — On rotten wood of *Pinus ponderosa* along the Sisson Southern Trail, 4500 feet.
Collection: 19290. Date: 7 April 1947. Abundance: V, A. Associates: *Arctostaphylos patula, Ceanothus velutinus.* Distribution: Germany, North America; Mt. Shasta.

Pellicularia vaga (Berk. & Curt.) Rogers. — On *Pinus ponderosa, Abies magnifica* var. *shastensis.* — On rotten wood of the former host along the Mud Creek Dam road at 4000 feet; on the latter at Horse Camp, 8000 feet.
Collections: 19364, 24047. Dates: 8 April 1947, 3 July 1948. Abundance: V, A. Associates: Trees of the Shasta Fir and Sierra Mixed Conifer zones. Distribution: Europe, North America; Mt. Shasta.

Pellicularia sp. — On *Quercus kelloggii* along the Squaw Valley Creek road, 4000 feet.
Collection: 18289. Date: 25 July 1946. Abundance: V, B. Associates: *Pinus ponderosa, Arctostaphylos patula.*

Peniophora assimilis Jackson & Deardon. — On *Purshia tridentata* branches about a mile north of Andesite Station, 5000 ft.
Collection: 19412. Date: 9 April 1947. Abundance: V, B. Associates: *Cercocarpus ledifolius, Arctostaphylos patula.* Distribution: Canada, Mt. Shasta.

Peniophora chaetophora (Hoehn.) Hoehn. & Litsch. — On rotten wood of *Tsuga mertensiana* along Squaw Valley Creek at about 8000 ft.
Collection: 20275. Date: 10 July 1947. Abundance: V, A. Associates: *Abies magnifica* var. *shastensis, Tsuga mertensiana.* Distribution: Europe, North America; Mt. Shasta.

Peniophora cinerea Auctt. — On *Cercocarpus ledifolius, Quercus kelloggii.* — Material assigned to this complex was obtained from near Bolam Station, and from along the Squaw Valley Creek Road.
Collections: 18291, 18340. Dates: 25 July, 2 Aug. 1946. Abundance: IV, B. Associates: Species of the chaparral vegetation. Distribution: Africa, Japan, Europe, North America; Mt. Shasta.

Peniophora cornosa Burt. — On rotten wood of Shasta fir near Horse Camp, 7800—8000 feet.
Collections: 20207, 20361. Dates: 1, 29 July 1947. Abundance: IV, A. Associate: *Abies magnifica* var. *shastensis.* Distribution: Eastern and western United States; Mt. Shasta.

Peniophora crassa Burt ex Peck. — On *Pinus ponderosa.* — On rotten wood along the Sisson Southern Trail, 4500 feet.
Collection: 19286. Date: 7 April 1947. Abundance: V, A. Associates: *Arctostaphylos patula, Ceanothus velutinus.* Distribution: Europe, North America, Mt. Shasta.

Peniophora exima Jackson & Deardon. — On hand made Shasta fir boards at Horse Camp.
Collections: 18033, 18034 (type). Date: 24 June 1946. Abundance: V, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: Canada, Mt. Shasta.

Peniophora gracillima Ell. & Ev. — On rotten *Pinus pondersa* wood along the Mud Creek Dam road.
Collection: 19349. Date: 8 April 1947. Abundance: V, A. Associates: *Abies concolor, Libocedrus decurrens*. Distribution: North America, Mt. Shasta.

Peniophora incarnata? (Pers.) Cke. — On *Cercocarpus ledifolius, Quercus kellogii*. — On rotten wood near Bolam Station on the north side of the mountain; and along the Squaw Valley Creek road on the south side of the mountain; 4000—5000 feet.
Collections: 18290, 18342, 19396. Dates: 25 July, 2 Aug. 1946; 9 Apr. 1947. Abundance: IV, B. Associates: Shrubs of the chaparral associations. Distribution: Europe, Japan, North America; Mt. Shasta.

Peniophora pallidula Bres. — On rotten Shasta fir wood in the Horse Camp area.
Collection: 18055. Date: 25 June 1946. Abundance: V, A. Associate: *Abies magnifica* var. *sthastensis*. Distribution: Vermont, Michigan, Mt. Shasta.

Peniophora sanguinea (Fr.) Hoehn. & Litsch. — On rotten *Pinus ponderosa* wood, Mud Creek Dam road, 4000 feet.
Collection: 19328. Date: 8 April 1947. Abundance: V, A. Associates: *Abies concolor, Libocedrus decurrens*. Distribution: Europe, North America, Mt. Shasta.

Peniophora (near) *subulata* (Bourd. & Galz.) Donk. — On rotten Shasta fir log at Horse Camp, 8000 feet.
Collection: 18138. Date: 30 June 1946. Abundance: V, A. Associate: The host. Distribution: Sweden, Austria, France, Ontario, Quebec, British Columbia, Massachusetts, Rhode Island, Ohio, Montana, Idaho, Washington, Oregon, California; Mt. Shasta.

Peniophora sp. — On rotten Shasta fir wood at Horse Camp, 8000 ft.
Collection: 18133. Date: 30 June 1946. Abundance: V, A. Associate: The host.

Peniophora sp. — On *Arctostaphylos patula, Cercocarpus ledifolius*. — On dead wood along the Mud Creek Dam road, and a mile north of Andesite Station, 4000—5000 feet.
Collections: 19338, 19397. Dates: 8, 9 April 1947. Abundance: V, B. Associates: Chaparral shrubs.

Peniophora sp. — On bark of *Libocedrus decurrens* north of Andesite Station on the north side of the Mountain.

Collection: 19404. Date: 9 April 1947. Abundance: V, A. Associates: *Pinus ponderosa, Cercocarpus ledifolius.*

Peniophora sp. — On *Purshia tridentata* branches near Andesite Station.
Collection: 19409. Date: 9 April 1947. Abundance: V, B. Associates: *Cercocarpus ledifolius, Arctostaphylos patula.*

Peniophora spp. — On dead wood of Shasta fir and *Ceanothus velutinus;* on the former on ridges north of Horse Camp at 8100 feet; on the latter at the north side of Cascade Gulch at 6000 feet.
Collections: 20214, 20343. Dates: 1, 25 July 1947. Abundance: V, A, B. Associates: Both species of *Abies.*

Phlebiella candidissima (Schw.) W. B. Cke. — Common on rotting wood of Shasta fir in the Horse Camp area at 7800 to 8000 feet. Usually this is found in small patches inside of logs because of the lower evaporation rate in such locations contrasted with that on the outside of logs, and the consequent higher humidity. Also at Panther Creek meadows.
Collections: 13271 and other collections between 1936 and 1941, 24061. Dates: 26 June 1939, 7 July 1948. Abundance: IV, A. Associates: *Abies magnifica* var. *shastensis, Tsuga mertensiana.*

On *Abies concolor.* — On rotten wood along the Sisson Southern Trail between 5000 and 6000 feet.
Collections: 19371, 20166, 24061. Dates: 9 April, 27 June 1947. Abundance: IV, A. Associates: *Abies concolor, Pinus ponderosa, Pseudotsuga taxifolia.* Distribution: North America; Mt. Shasta.

Stereum ?hirsutum Willd. ex Fr. — On *Arctostaphylos patula, Ceanothus velulinus, Quercus kelloggii, Quercus chrysolepsis, Salix scouleriana.* — On dead wood in chaparral areas on the west and north sides of the mountain, 4000—5000 feet.
Collections: 18096, 18097, 19303, 19314, 19319, 19317, 19423, 19424. Dates: 28 June 1946; 7, 9 April 1947. Abundance: IV, B. Associates: Chaparral shrubs. Distribution: Europe, North America; Mt. Shasta.

Stereum rugisporum (Ell. & Ev.) Burt. — On *Abies concolor, Abies magnifica* var. *shastensis, Tsuga mertensiana.* — Common on charred and unburned fallen logs in the Shasta Fir zone between Horse Camp and Mud Creek Canyon, and in the White Fir zone along the Sisson Southern Trail. The burned logs apparently resulted from spot lightning fires confined to single trees in the forest.
Collections: 10230, 13282, 14703, 18109, 18318, 18418, 18446, 19372, 20045, 20053, 20060, 20105, 20117, 20177, 25633, 28240, 28313, Exs. 45. Dates: 21 July 1938; 28 June 1939; 22 Aug. 1940; 28 June, 31 July, 29 Aug., 4 Sept. 1946; 9 April, 20, 22, 23, 25, 27 June 1947; 24 Aug. 1949; 7 July 1951. Abundance: III, A. Associate: The host species. Distribution: British Columbia; Colorado; Blue Mountains, Oregon; Cascade Mountains; California, Mt. Shasta.

Tomentella sp. — On rotting Shasta fir wood at Horse Camp, 8000 ft.
Collections: 20375, 20377. Date: 29 July 1947. Abundance: V, A. Associate: The host.

Trechispora brinkmannii (Bres.) Rog. & Jacks. — On rotting Shasta fir wood at Horse Camp.
Collection: 20064. Date: 22 June 1947. Abundance: V, A. Associate: The host.

Meruliaceae.

Merulius atropurpureus W. B. Cke. — One collection was made on rotting wood and bark of Shasta fir logs along the Sisson Southern Trail at about 7000 feet.
Collection: 10117 (type). Date: 17 June 1938. Abundance: V, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: Known only from this collection.

Merulius bellus Berk. & Curt. — Assignment of the following collections to this species is tentative. — On *Abies concolor, Abies magnifica* var. *shastensis, Cercocarpus ledifolius, Pinus attenuata, Tsuga mertensiana.* On rotten wood of these hosts in Shasta Fir, White Fir, Sierra Mixed Conifer and Chaparral associations between 4000 and 8000 feet.
Collections: 8519, 8564, 13270, 13273, 13289, 15663, 18439, 19341, 19375, 19381, 19399, 20206, 20279, 20372, Exs. 37. Dates: 22 June, 7 July 1937; 26, 28 June 1939; 7 August 1941; 30 June, 4 Sept. 1946; 8, 9 April, 1, 10, 25, 29 July 1947. Abundance: III, A. Associates: Conifers of all zones below the White Bark Pine zone. Distribution: Eastern North America; Mt. Shasta.

Merulius ceracellus Berk. & Curt. — Collected on rotting Shasta fir logs at Horse Camp, 8000 feet.
Collection: 10253, Exs. 48. Date: 28 July 1938. Abundance: IV, A. Associates: *Abies magnifica* var. *shastensis, Pinus albicaulis.* Distribution: Eastern North America, New Mexico, Washington, Mt. Shasta.

Merulius fugax Fr. — On rotting wood of Shasta fir, Horse Camp.
Collection: 20372. Date: 29 July 1947. Abundance: V, A. Associate: The host.

Merulius ravenelii Berk. — On *Abies concolor, Abies magnifica* var. *shastensis.* — On rotting wood at Horse Camp, 8000 feet, on the north side of Cascade Gulch, 6000 feet, and at the foot of the Sisson Southern Trail zig-zag, 5000 ft.
Collections: 18135, 18439, 19376, 19383, 20342. Dates: 30 June, 4 Sept. 1946; 9 April, 25 July 1947. Associates: Trees of the Shasta Fir and White Fir zones.

Merulius vastator Fr. — On rotting *Pinus ponderosa* log along the Mud Creek Dam road, 4000 feet.
Collection: 19344. Date: 8 April 1947. Abundance: V, A. Associates: *Abies concolor, Libocedrus decurrens.*

Phlebia albida Fr. — On *Abies concolor, Abies magnifica* var. *shastensis, Tsuga mertensiana.* — Occasionally found on logs throughout forests of these species. In some cases it becomes effused in large patches for a number of feet along the under side of logs with or without bark. Also producing a curtain-like formation hanging down from the under side of logs lying across depressions in the forest floor.
Collections: 10262, 13276, 13288, 15624, 15644, 18088, 18108, 18147, 19383, 20391, 26990, 28262, 28300, 20323, 28325, Exs. 128. Dates: 10 Aug. 1938; 26, 28 Aug. 1939; 28, 29 July 1941; 27, 28 June, 2 July 1946; 1 Aug. 1947; 28 Sept. 1950; 1, 2, 3 July 1951. Abundance: II, A. Associates: *Abies concolor, Abies magnifica* var. *shastensis, Pinus ponderosa, Pseudotsuga taxifolia.*

Coniophoraceae.

Coniophora olivacea (Fr.) Karst. — Collected on rotting wood of Shasta fir logs in the Horse Camp area, 7800—8100 feet.
Collections: One collection in 1937; 18069, 20215, 20385. Dates: 1937; 26 June 1946; 1, 29 July 1947. Abundance: IV, A. Associates: The host. Distribution: Europe, North America, Mt. Shasta.

Serpula americana (Burt) W. B. Cke. — On *Abies concolor, Abies magnifica* var. *shastensis, Pinus ponderosa, Tsuga mertensiana.* — Occasional on fallen logs from 5000 to 8000 feet in all zones between those elevations. It is found most frequently on Shasta fir logs and when growing luxuriently is subject to attack by numerous small beetles.
Collections: 10231, 13312, 15574, 15629, 18057, 18419, 20176, 20183, 20217, 24050, 25573, 25610 A Exs. 46. Dates: 21 July 1938; 5 July 1939; 12, 28 July 1941; 25 June, 29 Aug. 1946; 27 June, 1 July 1947; 4 July 1948; 24 Aug. 1949. Abundance: II, A. Associates: Conifers of all zones below the White Bark Pine zone. Distribution: Eastern North America, Wyoming, Washington; Mt. Shasta.

Clavariaceae.

Clavaria abietina Fr. — On very rotten wood of *Abies concolor* along the Sisson Southern Trail at about 5000 feet.
Collection: 19370. Date: 8 April 1947. Abundance: IV, A. Associates: *Pinus ponderosa, Pseudotsuga taxifolia.* Distribution: Europe, North America; Mt. Shasta.

Clavaria conjuncta Pk. — Under Shasta fir duff along the Sisson Southern Trail, along Squaw Valley Creek, and near Horse Camp.

Collections: 20033, 20138, 20163, 20257, 26999. Dates: 20, 27 June, 10 July 1947; 28 Sept. 1950. Abundance: IV, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, North America, Mt. Shasta.

Clavaria ?decurrens Pers. — On rotten Shasta fir wood on a ridge north of Horse Camp, 8100 feet.
Collection: 20204. Date: 1 July 1947. Abundance: V, A. Associate: The host. Distribution: Europe, Canada, New York, Oregon, Mt. Shasta.

Clavaria obtusissima Pk. — Collections have been made in the Sierra Mixed Conifer zone under a ponderosa pine, and along the Sisson Southern Trail in the Shasta Fir zone under duff and litter.

Collections: 15527, 20163. Dates: 27 June 1941; 27 June 1947. Abundance: V, D. Associates: *Pinus ponderosa, Arctostaphylos patula, Abies magnifica* var. *shastensis*. Distribution: Massachusetts, New York, North Carolina, Alabama, Missouri, Mt. Shasta.

Clavaria pinicola Burt. — Found under rotting Shasta fir logs near Horse Camp, 8000 feet.
Collections: 20164, 20216. Dates: 1941; 27 June, 1 July 1947. Abundance: IV, A. Associate: The host. Distribution: Idaho, Oregon, California; Mt. Shasta.

Clavaria secunda Berk. & Curt. — Subhypogaeous under *Abies concolor* and Shasta fir duff at 6000 feet along the Sisson Southern Trail.

Collections: 18119, 18230. Dates: 28 June, 11 July 1946. Abundance: V, D. Associates: Both species of fir. Distribution: Europe, New York, North Carolina, Oregon, Mt. Shasta.

Clavaria subdecurrens Coker. — On the under side of rotting Shasta fir wood lying on the ground near Horse Camp, 8000 feet.

Collection: 18334. Date: 31 July 1946. Abundance: V, D. Associate: The host. Distribution: New York, Oregon, Mt. Shasta.

Typhula sp. — On overwintered herbage on open slopes of the mountain, on grasses in a spring and on overwintered herbage wherever it is kept moist throughout the winter as well as at Wagon Camp, small sclerotia of the *Typhula* type have been found on *Arnica viscosa, Athyrium americanum, Castilleja miniata, Cryptogramma acrostichoides, Hulsea nana, Juncus orthophyllus, Lupinus obtusilobus* and *Veratrum californicum;* 5700—10,000 feet.

Collections: Among others: 15599, 16802, 18009, 18091, 18152, 18311, 20221. Dates: 23 July 1941; 7 Sept. 1942; 21, 27 June, 2, 30 July 1946; 2 July 1947. Abundance: III, C. (Attempts to produce the perfect state in culture have so far been unsuccessful.)

Hydnaceae.

Calodon amicus Quél. — A colony of 15 specimens of this species was found on the ground in Shasta fir woods under *Arctostaphylos nevadensis* shrubs along the Sisson Southern Trail at 7500 feet. Several years later a half dozen specimens were taken under *Abies concolor* duff on the north side of Cascade Gulch, 6000 feet.
Collections: 13367, 20346, Exs. 56. Dates: 28 July 1939; 25 July 1947. Abundance: IV, D. Associates: *Arctostaphylos nevadensis, Abies concolor, Abies magnifica* var. *shastensis.* Distribution: Europe, North America, Mt. Shasta.

Echinodontium tinctorium Ell. & Ev. — Observed on several trees of Shasta fir and white fir above the 6 mile post along the Sisson Southern Trail at about 6000 feet in the lower Shasta Fir zone; and along the Horse Camp-Wagon Camp Trail at 7000 feet on Shasta firs.
Collections: 10115, 15613, 20333. Dates: 17 June 1937; 25 July 1941; 18 July 1947. Abundance: IV, A. Associates: *Abies concolor, Abies magnifica* var. *shastensis.* Distribution: Western North America, Mt. Shasta.

Mycoacia alboviride (Morg.) Miller & Boyle. — Collected on rotten Shasta fir wood at Horse Camp, 8000 feet.
Collection: 13291. Date: 28 June 1939. Abundance: V, A. Associate: The host. Distribution: North America; Mt. Shasta.

Odontia cristulata Fr. — On *Quercus kelloggii.* — Collected from several rotting logs and branches of the host along the lane from McCloud to the Squaw Valley Creek spring.
Collections: 18286, 18287. Date: 25 July 1946. Abundance: V, B. Associates: *Pinus attenuata, Arctostaphylos patula.* Distribution: Europe, Iowa, Mt. Shasta.

Odontia crustosa (Fr.) Quél. — On dead branches of *Arctostaphylos patula* along the Sisson Southern Trail at 4500 feet.
Collection: 19320. Date: 7 April 1947. Abundance: V, B. Associates: *Ceanothus velutinus, Castanopsis chrysophylla.* Distribution: Europe, North America, Mt. Shasta.

Polyporaceae.

Aurantioporellus alboluteus (Ell. & Ev.) Murr. — Common on the under side of decaying Shasta fir logs throughout the Shasta Fir zone. The specimens must be collected within two weeks of the time the snow pack has melted from the logs on which they grow, or the collector will find little more than a pile of red dust under the log — remains from the action of hundreds of tiny beetles (*Dacne picea*) found in every collection made. Immediate fumigation is always necessary.

Collections: 8511, 8552, 10102, 10162, 10173, 10233, 15538, 15564, 18020, 18106, 24040, 24062, Exs. 49. One collection by G. C. Hedgcock. Dates: 3 Oct. 1911; 18 June, 1 July 1937; 11, 28 June, 1, 22 July 1938; 9, 16 July 1941; 23, 28 June 1946; 3, 4 July 1948. Abundance: II, A. Associates: *Abies magnifica* var. *shastensis, Pinus albicaulis, Tsuga mertensiana.*

On *Tsuga mertensiana.* — Collected once at Squaw Valley Creek meadows.

Collection: 25622. Date: 24 Aug. 1949. Abundance: V, A. Associates: as above. Distribution: New York, Colorado, Oregon, California, Mt. Shasta.

Coltricia perennis (L. ex Fr.) S. F. Gray. — Found occasionally on duff in the Shasta Fir, White Fir and Sierra Mixed Conifer zones.

Collections: Several collections in 1937—1941, 20250. Dates: 1937—1941, 10 July 1947. Abundance: IV, D. Associates: Trees of the listed zones. Distribution: Cosmopolitan; Mt. Shasta.

Coriolus hirsutus (Fr.) Quél. — Collected once on White Fir near Mount Shasta in June 1941. Abundance: IV, A. Distribution: Asia, Europe, North America; Mt. Shasta.

Coriolus versicolor (L. ex Fr.) Quél. — On *Cercocarpus ledifolius.* — Old specimens were found on dead wood near Andesite Station on the north side of the mountain.

Collection: 19401. Date: 9 April 1947. Abundance: V, B. Associates: *Purshia tridentata, Arctostaphylos patula.* Distribution: Cosmopolitan; Mt. Shasta.

Cryptoporus volvatus (Pk.) Hubbard. — On *Abies concolor.* — In the Sierra Mixed Conifer zone along the Wagon Camp road.

Collection: G. C. Hedgcock; 18116. Dates: 2 Oct. 1911; 28 June 1946. Abundance: IV, A. Associates: *Pseudotsuga taxifolia, Pinus ponderosa.*

On *Abies magnifica* var. *shastensis.* — Occasional on fallen logs and standing snags throughout the Shasta Fir zone.

Collections: 7576, 7640, 8517, 8630, 8673, 10208, 14633, 18021, 18375, 20054, 20496, 24064, 25572, 27010, Exs. 77. Dates: 9 Aug., 10 Sept. 1936; 22 June, 13. Aug., 27 Aug. 1937; 15 July 1938; 8 July 1940; 23 June, 16. Aug. 1946; 20 June, 27 Aug. 1947; 4 July 1948; 24 Aug. 1949; 28 Sept. 1950. Abundance: II, A. Associates: *Abies concolor, Abies magnifica* var. *shastensis.*

On *Libocedrus decurrens* Torr. — Collected by G. C. Hedgcock, 3 Oct. 1911. Abundance: V, A. Associates: *Pinus ponderosa, P. lambertiana, Abies concolor.*

On *Pinus ponderosa.* — A specimen collected by a ranger in Mt. Shasta in 1938 is filed at the Forest Pathology Collections, Beltsville, Maryland; found once on the north side of the mountain on a tree near timberline on the east side of Bolam Creek Canyon. Collection: 25703; Date: 26 Aug. 1949. Abundance: V, A. Associates: *Pinus lambertiana, Libocedrus decurrens, Pseudotsuga taxifolia; Pinus albicaulis, Abies magnifica* var. *shastensis.*

On *Pseudotsuga taxifolia.* — Found once by E. P. Meincke at Shasta Springs, 14 June 1926, according to a specimen filed at the Forest Pathology field office, San Francisco. Shasta fir trees in the Mountainhouse Creek devastated area appear able to survive the building up of gravel around their bases except when attacked by this species. Distribution: Siberia, Japan, North America; Mt. Shasta.

Fomes amarus (Hedgc.) Murr. — On *Libocedrus decurrens.* — Collected by G. C. Hedgcock at Sisson's, 2, 5 Oct. 1911, Specimen filed at Forest Pathology Collections, Beltsville, Maryland. — A specimen was obtained on a living tree along the Shasta-Lassen Highway (Cal. 89) five miles east of Pondosa in Shasta County.
Collection: 25569. Date: 23 Aug. 1949. Abundance: IV, A. Associates: *Pinus ponderosa, Abies concolor.* Distribution: With the host in Oregon and California; Mt. Shasta.

Fomes annosus (Fr.) Cke. — Infrequent on rotten wood of Shasta fir and Mountain hemlock at Horse Camp, Sand Flats and Panther Creek in the Shasta Fir zone.
Collections: 13300, 18002, 18005, 25606. Collected also by Hedgcock apparently in the same area. Dates: 2 Oct., 3 Nov. 1911; 5 July 1939; 17, 19 June 1946; 24 Aug. 1949. Abundance: IV, A. Associates: *Tsuga mertensiana, Abies magnifica* var. *shastensis.* Distribution: Northern Hemisphere; Mt. Shasta.

Fomes igniarius var. *arctostaphyli* Long. — On *Arctostaphylos patula.* — A specimen collected by J. W. Kimmey at Mount Shasta, 6 July 1942, is filed in the San Francisco field office of Forest Pathology. Distribution: Oregon, California; Mt. Shasta.

Fomes nigrolimitatus (Romell) Egeland. — On down logs of Shasta fir and mountain hemlock throughout the *Abies-Tsuga* zone.
Collections: 24058, 25610, 28292, 28319, 28320. Dates: 24 Aug. 1949, 2 July 1951. Abundance: IV, A. Associates: The host. Distribution: Europe, North America; Mt. Shasta.

Fomes officinalis (Fr.) Lloyd. — Observed on Shasta fir at about 7000 feet along the Sisson Southern Trail, on Sugar Pine along Squaw Valley Creek at about 5500 feet, and on mountain hemlock logs in the draw below Red Butte at 7500 feet. The rot symptoms of other dead wood indicate that the fungus is wider spread than its conks show.

Collections: 15513, 15540, 15764, 18005, 18283, 18410, 18411, 20406, 25570. Dates: 12 June, 11 July, 28 Aug. 1941; 19 June, 25 July, 29. Aug. 1946; 8 Aug. 1947; 23 Aug. 1949. Abundance: III, A. Associates: Coniferous trees of all zones below the White Bark Pine zone. Distribution: Europe, Western North America; Mt. Shasta.

Fomes pinicola (Fr.) Cke. — While the rot caused by this species is fairly common, the conks appear infrequently and then usually in an atypical manner. On Shasta fir and mountain hemlock in the *Abies-Tsuga* zone.
Collections: 13411, 15763, 18107, 24056, 25607. Dates: 24 Aug. 1939; 28 Aug. 1941; 28 June 1946; 4 July 1948; 23, 24 Aug. 1949. Abundance: III, A. Associates: Host trees. Distribution: Temperate regions; Mt. Shasta.

Fomes subroseus (Weir) Overh. — Occasional on stumps and logs near Horse Camp on Shasta fir, 8000 feet.
Collections: 8520, 8628. Collected by Hedgcock apparently in the same area. Dates: 3, 8 Oct. 1911; 22 June, 13 Aug. 1937. Abundance: IV, A. Associate: The host. Distribution: North America; Mt. Shasta.

Fulvifomes juniperina (Schrank) Murr. — On *Juniperus occidentalis.* — This host reaches the mountain at its north base although it forms large groves in the Shasta Valley to the north. A specimen collected in June 1938 was given to the University of California herbarium (539462) by Miss E. E. Morse. It is labeled as collected at Mount Shasta.

Ganoderma applanatum (Pers.) Pat. — On *Abies concolor.* — Several conks occurred on a prostrate log near the Squaw Valley Creek spring at 5000 feet.
Collection: 18284. Date: 25 July 1946. Abundance: IV, A. Associates: *Pseudotsuga taxifolia, Pinus lambertiana.* Distribution: Cosmopolitan; Mt. Shasta.

Ganoderma oregonense Murr. — Found at the base of living trees and on dead stumps and rotting logs of Shasta fir in the Shasta fir zone between 7000 feet in Cascade Gulch and 8000 feet at Horse Camp and between Horse Camp and Panther Creek meadows. Collections: 7588, 8650, 10308, 16794, 18435, 27002, 28347. The largest specimen obtained measured $42 \times 35 \times 13$ cm. Also collected by Hedgcock apparently in the same area. Dates: 3 Oct. 1911; 9 Aug. 1936; 17 Aug. 1937, 10 Sept. 1938; 7 Sept. 1942; 4 Sept. 1946; 28 Sept. 1950; 4 July 1951. In June 1946 three large old specimens were observed on each of three dead Shasta firs on either falled logs or stumps. Abundance: III, A. Associates: *Abies magnifica* var. *shastensis, Tsuga mertensiana.* Distribution: Oregon, California; Mt. Shasta.

Gloeophyllum sepiarium (Schaeff. ex Fr.) Karst. — Fruit bodies were obtained from the sawed ends of piled logs of Shasta fir cleared from the Snowline Highway on sapwood seven

years after the trees were cut; on wood at Panther Creek meadows. Collections: 15530, 28282. Dates: 3 July 1941, 1 July 1951. Abundance: IV, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: North temperate regions; Mt. Shasta.

Hirschioporus abietinus (Dicks. ex Fr.) Donk. — On *Abies magnifica* var. *shastensis*. — Common on bark and wood of dead saplings and trees near Horse Camp and throughout the Shasta Fir zone. This form on Shasta firs appears to be much more stunted and atypical in most years in growth than collections made in the Sierra Nevada to the south.

Collections: 8529, 18049, 18352, 18438. Observed a number of times between 1936 and 1947 but material was usually too poor to collect. Collected by Hedgcock in the same general area. Dates: 3 Oct. 1911; 26 June 1937; 25 June, 10 Aug., 4 Sept. 1946. Abundance: III, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: On conifers in the northern hemisphere; Mt. Shasta.

Laetiporus sulphureus (Bull. ex Fr.) Bond. & Sing. — On *Abies magnifica* var. *shastensis*. — One tree on a ridge between Panther Creek meadows and Horse Camp above the Snowline Highway at 7500 feet was found to have several young fruit bodies between the base and five feet above the ground. In June 1946 a massive fruit body of the previous fall was found on a dead tree near Horse Camp at 8000 feet. New growth of sporophores was initiated on this tree in late August and early September. A tree along the Snowline Highway at about 7000 feet was found to be bearing a large young conk in 1949.

Collections: 16808, 18445, 25715. Dates: 8 Sept. 1942, 4 Sept. 1946, 26 Aug. 1949. Abundance: IV, A. Associates: The host. Distribution: Cosmopolitan; Mt. Shasta.

Polyporus elegans (Bull.) Fr. — On *Prunus emarginata, Ceanothus velutinus*, and on unidentified sticks in litter. — Found several times from 6500 feet along the Sisson Southern Trail on snowbrush branches killed by advancing groves of *Abies concolor*, to a creek at 3550 feet in Mount Shasta.

Collections: 15510, 15511, 15524, 15579, 20189, 20420, 26993. Dates: 7, 27 June, 18 July 1941; 27 June, 8 Aug. 1947; 28 Sept. 1950. Abundance: IV, D. Associates: Trees of the Sierra Mixed Conifer and White Fir zones. Distribution: Europe, North America, Mt. Shasta.

Poria albolutescens (Rom.) Egeland. — On rotting Shasta fir wood near Horse Camp, 8100 feet.

Collection: 20213. Date: 1 July 1947. Abundance: V, A. Associate: The host. Distribution: Europe, Northern North America; Mt. Shasta.

Poria asiatica Overh. — On rotting Shasta fir wood at Horse Camp, 8000 feet.

Collection: 18132, 20062. Dates: 30 June 1946, 22 June 1947. Abundance: V, A. Associate: The host. Distribution: Siberia, Western North America; Mt. Shasta.

Poria ferrea (Pers.) Bourd. & Galz. — On *Abies magnifica* var. *shastensis, Tsuga mertensiana.* — On rotten wood in the Shasta Fir zone at Horse Camp and along Squaw Valley Creek between 6500 and 8000 feet.
Collections: 18067, 20263. Dates: 26 June 1946, 10 July 1947. Abundance: IV, A. Associates: The host species. Distribution: Europe, North America; Mt. Shasta.

Poria ferrugineo-fusca Karst. — On *Abies magnifica* var. *shastensis.* — On rotting wood along Squaw Valley Creek, 6000 feet.
Collection: 20253. Date: 10 July 1947. Abundance: V, A. Associate: The host. Distribution: Europe, North America; Mt. Shasta.

Poria feruginosa (Schrad. ex Fr.) Karst. — On pieces of logs used as stools at Horse Camp, 8000 feet. Isolated from the rot formed on such stools when they are in contact with the ground. Rotted areas in the case of these logs are covered with brown, felty, masses of mycelium. Similar masses of mycelium have been observed in other localities on the mountain. Isolations were made by Ross W. Davidson.
Collections: 18189, 18434. Dates: 9 July, 4 Sept. 1946. Abundance: IV, A. Associate: The host. Distribution: Europe, North America, Mt. Shasta.

Poria lenis Karst. — On *Abies magnifica* var. *shastensis, Tsuga mertensiana.* — Collected occasionally at Horse Camp and Squaw Valley Creek meadows inside rotten logs.
Collections: 8671, 10232, 10287, 13280, 15560, 18136, 18209, 18210, 20269, 24051, Exs. 57. Dates: 27 Aug. 1937; 21 July, 8 Sept. 1938; 26 June 1939; 16 July 1941; 30 June, 10 July 1946; 10 July 1947; 4 July 1948. Abundance: III, A. Associate: The host. Distribution: Finland, North America; Mt. Shasta.

Poria rufa (Schrad. ex Fr.) Cke. — In a log of *Pinus ponderosa* near Bolam Creek, 6000 feet, north side of the mountain.
Collection: 10280. Date: 20 Aug. 1938. Abundance: V, A. Associate: *Pinus ponderosa.* Distribution: Europe, North America; Mt. Shasta.

Poria subincarnata (Pk.) Murr. — On rotting Shasta fir wood near Horse Camp, 8000 feet.
Collections: 18064, 20063, 20379. Dates: 26 June 1946; 22 June, 29 July 1947. Abundance: V, A. Associate: The host. Distribution: North America, Mt. Shasta.

Poria ?tenuis (Schw.) Cke. — On *Cercocarpus ledifolius.* — Material collected from several branches of a large shrub on the north

side of the mountain near Andesite Station is referred here tentatively by J. L. Lowe.
Collection: 19403. Date: 9 April 1947. Abundance: IV, B. Associates: *Purshia tridentata, Arctostaphylos patula.* Distribution: Europe, North America; Mt. Shasta.

Poria vaporaria (Fr.) Cke. — On *Abies magnifica* var. *shastensis, Tsuga mertensiana.* — Collected once at Squaw Valley Creek and once along the Ski Trail below Horse Camp.
Collections: 10290, 18146. Dates: 8 Sept. 1938, 2 July 1946. Abundance: V, A. Associates: The hosts. Distribution: Ceylon, Tasmania, New Zealand, Europe, Cuba, North America; Mt. Shasta.

Porodaedalea pini (Thore ex Fr.) Murr. — The form of this fungus referred to as *Trametes pini* var. *abietis* Karst. has been found several times in fruit inside rotting logs of Shasta fir at and near Horse Camp.
Collections: 8516, 8566, 13284, 13285, 15661, 16795, 18067. Dates: 22 June, 7 July 1937; 28 July 1939; 7 Aug. 1941; 7 Sept. 1942; 26 June 1946. Abundance: IV, A. Associates: The host. Distribution: Temperate regions; Mt. Shasta.

Spongipellis borealis (Fr.) Pat. — Found once on *Abies concolor* along the Sisson Southern Trail at 6000 feet.
Collection: 20406. Date: 8 Aug. 1947. Abundance: V, A. Associate: The host. Distribution: Australia, Europe, North America; Mt. Shsata.

Spongiporus leucospongia (Cke. & Harkn.) Murr. — On *Abies concolor, Abies magnifica* var. *shastensis, Arctostaphylos patula, Pinus albicaulis, Tsuga mertensiana.* — This fungus occurs most commonly on rotting logs of Shasta fir. In an avalanche flat in the lower part of the Horse Camp Creek area most of the prostrate logs had fruit bodies of this species on them in one or more of the years between 1936 and 1947. The fruit bodies are apparently capable of reviving during periods of light rains which occur about once a month during the summer. Apparently they develop preceding or during the snow pack. On a stick, apparently of white bark pine, used as a mile post along the Summit Trail at about 9000 feet, above the limits of woody growth along this trail; this species fruited in 1939. The collection on green manzanita was made under ponderosa pines in the Sierra Mixed Conifer zone and the host stick was unmistakably of the manzanita.
Collections: on Shasta fir: 8568, 10116, 10126, 10134, 10171, 14633-A, 15537, 15545, 15563, 15573, 15643, 18022, 18436, 20106, 20122, 24041, 24057, 28259, Exs. 30-A. Collected once by Hedgcock on the southwest side of the mountain, apparently along the Sisson Southern Trail; on white fir: 10248, 16633, collected once at Sisson by Hedgcock; on white bark pine: 13355; on mountain hemlock: 15760, 18415, 28312; on green manzanita: 15520. Dates: 3, 6 Oct. 1911; 9 July 1937; 17, 20

June, 1, 28 July 1938; 26 July 1939; 8 July 1940; 27 June, 9, 12, 16, 18, 29 July, 28 Aug. 1941; 30 May 1942; 23 June, 29 Aug., 4 Sept. 1946; 23, 25 June 1947; 3, 4 July 1948; 1, 3 July 1951. Abundance: II, A; V, B. Associates: Coniferous trees of all zones. Distribution: Colorado, Wyoming, Montana, Idaho, Washington, Oregon, California; Mt. Shasta.

Tyromyces caesius (Schrad. ex Fr.) Murr. — On *Pinus attenuata,* and on a pine board. — On the south side of the mountain above McCloud along the Mud Creek Dam road, and along the Sisson Southern Trail, at 4000 feet.
Collections: 19294, 19350. Dates: 7, 8 April 1947. Abundance: V, A. Associates: Chaparral and Sierra Mixed Conifer zone conifers. Distribution: Europe, North America; Mt. Shasta.

Agaricales.

Hygrophoraceae.

Hygrophorus gliocyclus Fr. — Collected once in 1941 on Shasta fir duff and litter near melting snowbanks. Abundance: V, D. Associate: *Abies magnifica* var. *shastensis.* Distribution: Europe, California; Mt. Shasta.

Hygrophorus russula (Fr.) Quél. — Collected on Shasta fir and hemlock litter and duff along the Sisson Southern Trail and around snowbanks above Panther Creek meadows.
Collections: 1941; 26798-A, 28333. Dates: 1941, 1 July 1950, 3 July 1951. Abundance: V, D. Associates: *Abies magnifica* var. *shastensis, Tsuga mertensiana.* Distribution: Europe, North America; Mt. Shasta.

Hygrophorus vernalis A. H. Smith. — A large colony was found in 1941 on humus among procumbent shrubs of *Phyllodoce empetriformis* under mountain hemlock in the Panther Creek heather meadows at about 8000 feet. In July 1948 it was again observed on hemlock-Shasta fir litter and duff n the same meadow.
Collections: 15636, 24069. Dates: 50 specimens obtained 28 July 1941, abundant 4 July 1948. Abundance: IV, D. Associates: *Phyllodoce empetriformis, Tsuga mertensiana, Abies magnifica* var. *shastensis.* Distribution: Washington, Oregon; Mt. Shasta.

Tricholomataceae.

Armillaria mellea Fr. — Typical rhizomorphs have been observed in connection with frequent windfalls of Shasta fir and sugar pine. No fruit bodies have been observed on the mountain but Ranger Jack Reveal, formerly of the Sacramento District, Shasta National Forest, sent the writer specimens taken from a garbage pit at the Mott yard of the Shasta National Forest at 3000 feet along the Highway between Mount Shasta and Dunsmuir. October 1947. Abundance: III, A. Associates: *Abies magnifica* var. *shastensis, Pinus*

lambertiana, Pseudotsuga taxifolia, Abies concolor. Distribution: Europe, Asia, Australia, North America; Mt. Shasta.

Armillaria zelleri Smith & Stuntz. — On the ground along the Sisson Southern Trail under Shasta firs at about 7500 feet.
Collection: 26998. Date: 28 Sept. 1950. Abundance: V, D. Associate: *Abies magnifica* var. *shastensis.* Distribution: Washington, Oregon, Mt. Shasta.

Cantharellula umbonata (Fr.) Singer. — On the ground under duff of Shasta fir along the Sisson Southern Trail at about 7500 feet.
Collection: 27012. Date: 28 Sept. 1950. Abundance: V, D. Associate: *Abies magnifica* var. *shastensis.* Distribution: Europe, North America, Mt. Shasta.

Clitocybe sp. — Several specimens were obtained in ponderosa pine woods near McCloud, 3500 ft.
Collection: 19365. Date: 8 April 1947. Abundance: V, D. Associate: *Pinus ponderosa.*

Clitocybe sp. — A number of mounds were found in pine woods near McCloud. Upon opening them large clusters of up to 45 white mushrooms were found in them. Also found at Horse Camp and along the Sisson Southern Trail under Shasta firs.
Collections: 19367, 20079, 26997. Dates: 8 April, 22 June 1947; 28 Sept. 1950. Abundance: IV, D. Associates: *Pinus ponderosa; Abies magnifica* var. *shastensis.*

Collybia sp. — Found on occasional Shasta fir stumps and logs near Horse Camp. Until 1947 it was usually found in dry condition for without irrigation from melting snow it dries up quickly.

Laccaria sp. — On the ground in pine woods near McCloud, 3500 feet.
Collection: 19363. Date: 8 April 1947. Abundance: V, D. Associate: *Pinus ponderosa.*

Lentinus lepideus Fr. — On *Pinus ponderosa.* — Specimens have been found on old stumps along the Wagon Camp road between Howard and Wagon Camp.
Collections: 8620, 10278, 13400. Dates: 6 Aug. 1937, 19 Aug. 1938, 22 Aug. 1939. Abundance: IV, A. Associates: *Pinus ponderosa, Abies concolor, Pseudotsuga taxifolia, Libocedrus decurrens.*

On *Pinus albicaulis.* — Specimens have been found on prostrate logs on the ridge above Horse Camp in the White Bark Pine zone, and in the upper Squaw Valley Creek meadows in the upper Shasta Fir zone; the first at about 8500 feet and the second at 8000 feet. Specimens of decaying wood collected near the water supply spring above Horse Camp, 8250 feet, and in the South Gate, 8000 feet, contained mycelium of a rot caused by this fungus. The type of rot

observed throughout the White Bark Pine zone indicates that this species is probably wide spread on the mountain.
Collections: 10249, 13414, 20292, ?20466. Dates: 28 July 1938; 24 Aug. 1939; 10 July, 20 Aug. 1947. Abundance: III, A. Associates: *Pinus albicaulis, Abies magnifica* var. *shastensis, Tsuga mertensiana.* Distribution: Siberia, Europe, North America; Mt. Shasta.

Lentinus sp. — Sessile specimens have been found on occasional logs of Shasta fir and mountain hemlock especially in the avalanche flat below Horse Camp and at Panther Creek meadows.
Collections: 14620, 14634, 15521, 15533, 15544, 15550, 15562, 15633, 18025, 18145, 18216, 24043, 24046, 24070, 25632, 28299, 28330, 28331. Dates: 3, 8 July 1940; 27 June, 9, 12, 14, 16, 28 July 1941; 23 June, 2, 10 July 1946; 3, 4 July 1948; 24 Aug. 1949; 2, 4 July 1951. Abundance: III, A. Associates: *Abies magnifica* var. *shastensis, Tsuga mertensiana.*

On *Haplopappus bloomeri* var. *angustatus.* — Found only once on dead branches at Horse Camp, 8000 feet.
Collection: 24042. Date: 3 July 1948. Abundance: V, B. Associate: *Abies magnifica* var. *shastensis.*

Lyophyllum sp. — Large colonies of this mushroom follow the snowbanks on Shasta fir duff and litter between 6500 and 8000 feet. The mushroom fruits as the snowbank melts away and as soon as the effects of this irrigation evaporate or percolate the mushroom dries up, disappearing within two weeks of its initiation.
Collections: Collected once in 1941, several times in 1946. Abundance: IV, D. Associate: *Abies magnifica* var. *shastensis.* Distribution: In timberline areas throughout the Cascade Mountains, the Blue, Wasatch and Medicine Bow Mountains.

Melanoleuca sp. — On collection, 19359, was made along the Mud Creek Dam road above McCloud. Date: 8 April 1947. Abundance: V, D. Associates: *Pinus ponderosa, Abies concolor, Libocedrus decurrens.*

Mycena alcalina (Fr.) Quél. — Twenty-two specimens were found once on a white fir log at the foot of the zig-zag on the Sisson Southern Trail, 5000 feet.
Collection: 19377. Date: 9 April 1947. Abundance: V, A. Associates: *Pseudotsuga taxifolia, Pinus ponderosa.* Distribution: France, North America; Mt. Shasta.

Mycena gracilis (Fr.) Quél. — Three specimens were found on ponderosa pine litter along the Mud Creek Dam road above McCloud.
Collection: 19352. Date: 8 April 1947. Abundance: V, D. Associates: *Abies concolor, Libocedrus decurrens, Pinus ponderosa.* Distribution: France, Manitoba, New York, Michigan, Idaho, Mt. Shasta.

Mycena griseiconica Kauffman. — Collected on rotten wood of *Libocedrus decurrens* and *Pinus ponderosa* along the Mud

Creek Dam road at about 4000 feet above McCloud, and near McCloud at about 3500 feet.
Collections: 19356, 19357, 19366. Date: 8 April 1947. Abundance: IV, A. Associates: *Pinus ponderosa, Abies concolor, Libocedrus decurrens.* Distribution: France, British Columbia, Washington, Oregon; Mt. Shasta.

Mycena griseoviridis A. H. Smith. — Found in nearly completely decayed piles of debris from Shasta fir and mountain hemlock logs and stumps just as the snow is melting throughout the Shasta Fir zone. Some specimens had pushed up through the snow, others were as much as five feet from the snow but well irrigated. The specimens disappear as soon as the water supplied by the melting snow is gone. Also found at the foot of the zig-zag on the Sisson Souhtern Trail at 5000 feet on rotten white fir wood.
Collections: 15571, 15651, 18218, 19378, 28244, 28298, 28340. Dates: 14 specimens on 16 July, 39 specimens on 29 July 1941; 10 July 1946; 9 April 1947; 1, 2, 4 July 1951. Abundance: IV, D. Associates: *Abies magnifica var. shastensis, Tsuga mertensiana, Pseudotsuga taxifolia, Pinus ponderosa.* Distribution: Olympic Mts., Mt. Adams, Washington; Blue Mountains, Oregon; Mt. Shasta.

Mycenia laevigata (Lasch) Quél. — Five specimens were found on a rotten conifer log at the foot of the zig-zag on the Sisson Southern Trail, 5000 feet.
Collection: 19379. Date: 9 April 1947. Abundance: V, D. Associates: *Abies concolor, Pseudotsuga taxifolia, Pinus ponderosa.* Distribution: Europe, North America, Mt. Shasta.

Mycena lilacifolia (Pk.) A. H. Smith. — Eighteen specimens were found on a ponderosa pine stump along the Mud Creek Dam road above McCloud at about 4000 feet. Also found in the Horse Camp area commonly on Shasta fir logs.
Collection: 19353. Date: 8 April 1947. Abundance: IV, A. Associates: *Abies concolor, Pseudotsuga taxifolia, Libocedrus decurrens; Abies magnifica* var. *shastense.* Distribution: Ontario, New York, Michigan, Tennessee, Washington, Oregon, Mt. Shasta.

Omphalina rustica (Fr.) Quél. — Thirty-four specimens were found on sandy ground in ponderosa pine woods near McCloud, 3500 feet.
Collection: 19362. Date: 8 April 1947. Abundance: V, D. Associate: *Pinus ponderosa.* Distribution: Europe, North America; Mt. Shasta.

Pleurotus petaloides Bull. ex Fr. — Found once on a log of Shasta fir at Horse Camp.
Collection: 13286. Date: 28 June 1939. Abundance: V, A. Associate: The host. Distribution: Europe, North America, Mt. Shasta.

Tricholoma rhizoideum A. H. Smith. — Collected once on Shasta fir duff and litter at about 7000 feet along the Sisson

Southern Trail. A large colony followed the exposure of the substratum by melting snow banks. As the substratum dried out the fruit bodies dried up and eventually disappeared.

Collections: One collection in 1941. Abundance: III, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: MacKenzie Pass, Oregon; Mt. Shasta.

Amanitaceae.

Amanita spp. — Specimens of what might have been *Amanita phalloides* Fr. occur occasionally on Shasta fir duff at about 7000 feet along the Sisson Southern Trail. In this area and throughout the Shasta fir forest another *Amanita* occurs occasionally. Identification hat not been completed.

Amanitopsis vaginata Fr. — Occasional specimens have been observed on Shasta fir duff at about 7000 feet.

Collection: 15685. Date: 8 Aug. 1941. Abundance: V, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, North America; Mt. Shasta.

Pluteus cervinus Fr. — Found once in the meadow at Bear Springs, 5000 feet.

Collection: 8576-A. Date: 9 July 1937. Abundance: V, D. Associates: *Libocedrus decurrens, Pinus jeffreyi*. Distribution: Africa, Ceylon, North America, Europe, Mt. Shasta.

Agaricaceae.

Agaricus arvensis Fr. — One specimen was found under Shasta firs near shrubs of mountain manzanita on a ridge below Horse Camp at about 8000 feet.

Collection: 15569. Date: 16 July 1941. Abundance: V, D. Associates: *Abies magnifica* var. *shastensis, Arctostaphylos nevadensis*. Distribution: Ceylon, Europe, North America; Mt. Shasta.

Coprinaceae

Coprinus comatus Fr. — Three mushrooms were found under some white bark pines on the knob above Horse Camp springs. They were long stemmed, most of the stem reaching into the soil below the duff under the pines, 8250 feet.

Collection: 13314. Date: 8 July 1939. Abundance: V, D. Associate: *Pinus albicaulis*. Distribution: Europe, North America; Mt. Shasta.

Psathyrella atrifolia (Pk.) Smith. — Six specimens were found scattered on the ground in the chaparral along the old Sisson Southern Trail, 4000 feet.

Collection: 19326. Date: 7 April 1947. Abundance: V, D. Associates: *Arctostaphylos patula, Ceanothus velutinus*.

Strophariaceae.

Flammula graveolens Pk. — Collected once on rotten Shasta fir wood at Horse Camp in 1941.

Abundance: V, A. Associate: The host. Distribution: North America, Mt. Shasta.

Flammula penetrans Pk. — Collected once in 1939 on Shasta fir wood near Horse Camp.

Abundance: V, A. Associate: The host. Distribution: North America, Mt. Shasta.

Naematoloma fasciculare (Fr.) Karst. — A cluster of mushrooms was found on humus at the base of a white fir at Wagon Camp.

Collection: 15699. Date: 8 Aug. 1941. Abundance: V, D. Associates: *Abies concolor, Abies magnifica* var. *shastensis.* Distribution: Asia, Europe, North America; Mt. Shasta.

Pholiota trachyspora Clements. — Found once in Shasta fir duff at 7000 feet in 1941.

Abundance: V, D. Associate: *Abies magnifica* var. *shastensis.* Distribution: Western North America; Mt. Shasta.

Stropharia sienna Kauffman. — One specimen was found near a pine log along the Mud Creek Dam road above McCloud.

Collection: 19358. Date: 8 April 1947. Abundance: V, D. Associates: *Abies concolor, Pinus ponderosa, Libocedrus decurrens.*

Pholiota involuta. — On a Shasta fir log near Panther Creek meadows, 7500 feet.

Collection: 28350. Date: 4 July 1951. Abundance: V, A. Associate: The host.

Cortinariaceae.

Cortinarius (nr. *C. aurifolius*) sp. — Specimens were collected along the Mud Creek Dam road above McCloud at about 4000 feet.

Collection: 19355. Date: 8 April 1947. Abundance: V, D. Associates: *Pinus ponderosa, Libocedrus decurrens.*

Cortinarius cotoneus Fr. — Collected once in 1942 on coniferous duff, near Horse Camp.

Abundance: V, D. Associate: *Abies magnifica* var. *shastensis.* Distribution: Europe, California, Mt. Shasta.

Cortinarius heterosporus Bres. — Nearly buried in soil under manzanitas along the old snowline road in the chaparral.

Collection: 19324. Date: 7 April 1947. Abundance: IV, D. Associates: *Arctostaphylos patula, Ceanothus velutinus.* Distribution: Europe, North America; Mt. Shasta.

Cortinarius orichalceus Fr. — Probably nearly buried in the ground under manzanita but kicked out by some animal; in the chaparral along the old snowline road at about 4000 feet.
Collection: 19323. Date: 7 April 1947. Abundance: V, D. Associates: *Arctostaphylos patula, Ceanothus velutinus.* Distribution: Europe, North America, Mt. Shasta.

Naucoria sp. — Sixteen specimens were found on manzanita bark along the old Sisson Southern Trail between 4000—4500 feet.
Collection: 19322. Date: 7 April 1947. Abundance: V, B. Associates: *Ceanothus velutinus, Ceanothus chrysophylla, Arctostaphylos patula.*

Crepidotaceae.

Crepidotus sp. — Common on branches of Shasta fir in one grove near Horse Camp, 8000 feet, after an early September rain.
Collection: 18448. Date: 4 Sept. 1946. Abundance: IV, A. Associate: The host. Distribution: Identification not complete.

Rhodophyllaceae.

Rhodophyllus sp. — Eight specimens were found on duff in pine woods near McCloud, 3500 feet.
Collection: 19364. Date: 8 April 1947. Abundance: V, D. Associate: *Pinus ponderosa.*

Paxillaceae.

Paxillus panuoides Fr. — Found on short lengths of Shasta fir logs used as stools in cabins with dirt floors and in cabin yards at Horse Camp, 8000 feet, just after the snow had melted. Also on a ponderosa pine board along the Mud Creek Dam road at about 4000 feet.
Collections: 15535, 18072, 19332. Dates: 9 July 1941, 27 June 1946, 8 April 1947. Abundance: IV, A. Associates: *Abies magnifica* var. *shastensis; Abies concolor, Libocedrus decurrens.* Distribution: Africa, Europe, North America; Mt. Shasta.

Boletaceae.

Boletus albidus ssp. eupachypus Konrad. — Collected occasionally throughout the Shasta Fir zone especially in the area between Cascade Gulch and Mud Creek Canyon. This species presents a subhypogaeous habit. It grows under the duff pushing up dry segments of the duff an litter as the fruiting bodies expand. Squirrels like it as, apparently do deer. In 1946 it was collected as low as 6000 feet in the White Fir zone and as high as 8000 feet in the Shasta Fir zone near Horse Camp. No mycorrhizal relationship has been established between this species and the firs near which it grows although such a relation is possible. The largest fruit bodies found were 17 cm. in diameter.
Collections: 10281, 10304, 14661, 15721, 18327, 18337, 18338, 18374, 20165, 20231, 20347, 20355, Exs. 203. Dates: 8, 10 Sept. 1938; 8 Aug. 1940;

18 Aug. 1941; 31 July, 2, 19 Aug. 1946; 27 June, 10, 25 July 1947. Abundance: III, D. Associates: *Abies magnifica* var. *shastensis, Abies concolor, Tsuga mertensiana.* Distribution: France, Nova Scotia, Michigan, Mt. Rainier, Mt. Shasta.

Boletus frustosus Snell & Dick. — Collected in the same habitats as the above species. No animals appear to eat this species as is evident in the case of the above species. It is also, in open woods, subhypogaeous, although it has been found exposed on sandy open banks of Mud Creek Canyon.

Collection: 14716. Date: 22 Aug. 1940. Observed during some summers between 1937 and 1941. Abundance: IV, D. Associates: *Abies magnifica* var. *shastensis, Tsuga mertensiana.* Distribution: Northern Idaho, Northern Nevada, Sierra Nevada mountains, Mt. Shasta.

Boletus miniato-olivaceous Frost. — Collected under white fir along the Wagon Camp Road above Bear Springs.

Collections: 14628, 15687. Dates: 5 July 1940, 8 Aug. 1941. Abundance: V, D. Associate: *Abies concolor.* Distribution: Eastern United States; Mt. Shasta.

Suillus sp. — Near rotten wood of Shasta fir near Horse Camp, 8000 feet.

Collection: 18449. Date: 4 Sept. 1946. Abundance: V, D. Associate: *Abies magnifica* var. *shastensis.*

Russulaceae.

Russula delica Fr. — One specimen was found under Shasta fir duff along the Sisson Southern Trail at 7000 feet.

Collection: 27001. Date: 28 Sept. 1950. Associate: *Abies magnifica* var. *shastensis.* Abundance: V, D.

Gastromycetes.

Hymenogastrales.

The first three orders and some of the genera in other orders are hypogaeous in fruiting habit. Most of the collections on which these names were based were obtained within a mile of Horse Camp in the Shasta Fir zone. Most of the specimens were associated with Shasta fir wood, either being found buried deep inside of logs, or beside logs and rotting sticks buried in the ground. Some were found in the soil and the collections of these were more accidental than planned since there was little or no evidence before the soil was disturbed that fungi grew there. One or two specimens were found on stones or logs, obviously dug up by rodents and left to dry in the sun. The following numbers of hypogaeous specimens were collected in the indicated years: 1937: 5; 1938: 11; 1939: 26; 1940: 21; 1941: 17; 1942: 4.

Hydnangiaceae.

Archangeliella lactarioides Zeller. — Collection: 1466. Date: 26 July 1940. Abundance: V, D. Distribution: Known only from Mt. Shasta.

Archangeliella magna (Parks) Zeller. — Collection: 13363. Date: 25 July 1939. Abundance: V, D. Distribution: Central and northern California; Mt. Shasta.

Elasmomyces alpinus (Zeller) Zeller. — Collection: 15797. Date: 7 Sept. 1942. Abundance: V, D. Distribution: Known only from Mt. Shasta.

Elasmomyces echinosporus Zeller & Dodge. — Collections: 14700, 14701. Date: 21 Aug. 1940. Abundance: V. D. Distribution: Western North America; Mt. Shasta.

Hydnangium parksii Zeller & Dodge. — Collected once in 1938. Distribution: Washington, Oregon, California, Mt. Shasta.

Hymenogastraceae.

Gymnoglossum elasmomycetoides Zeller. — Collection: 10216. Date: 18 July 1938. Abundance: V, D. Distribution: Known only from Mt. Shasta.

Hymenogaster remyi Zeller & Dodge. — Collection: 13376. Date: 31 July 1939. Abundance: V, D. Distribution: High Alps in Europe; Mt. Shasta.

Melanogastraceae.

Melanogaster tuberiaeformis Corda. — Collection: 15577. Date: 16 Sept. 1941. Abundance: V, D. Distribution: Europe, Idaho, Washington, Oregon, California; Mt. Shasta.

Melanogaster variegatus (Vitt.) Tul. — Collections: 13260, 13301, 13302. Dates: 17 June, 5 July 1939. Abunddance: IV, D. Distribution: Europe, Western North America; Mt. Shasta.

Rhizopogonaceae.

Rhizopogon brunnescens Zeller. — Collections: 13305, 13306. Date: 5 July 1939. Abundance: V, D. Distribution: Known only from Mt. Shasta.

Rhizopogon exiguus Zeller. — Collection: 13424. Date: 20 Aug. 1939. Abundance: V, D. Distribution: Washington, California, Mt. Shasta.

Rhizopogon occidentalis Zeller & Dodge. — Collection: 13264. Date: 26 June 1939. Abundance: V, D. Distribution: Idaho, Washington, Oregon, California; Mt. Shasta.

Rhizopogon pannosus Zeller & Dodge. — Collections: 16595?, 16800. Date: 7 Sept. 1942. Abundance: V, D. Distribution: Pacific coast states, Mt. Shasta.

Rhizopogon provincialis Tul. — Collection: 14699. Date: 21 Aug. 1940. Abundance: V, D. Distribution: New Zealand, Western Europe, Pacific Coast states; Mt. Shasta.

Rhizopogon rubescens Tul. — Collection: 15678. Date: 7 Aug. 1941. Abundance: V, D. Distribution: Cosmopolitan in temperate Zone; Mt. Shasta.

Rhizopogona separabilis Zeller. — Collection: 8455. Date: 3 Sept. 1937. Abundance: V, D. Distribution: Oregon Coast, Mt. Shasta.

Gautieriales.

Gautieriaceae.

Gautieria monticola Harkn. — Found in large clusters, as many as 40 together as in a hill of potatoes, along the Sisson Southern Trail.
Collections: 13304, 13364, 20192, 20238, Exs. 275. Dates: 5, 25 July 1939; 28 June, 10 July 1947. Abundance: IV, D. Distribution: Washington, Oregon, California, Mt. Shasta.

Hysterangiales.

Hysterangiaceae.

Hysterangium darkeri Zeller. — Collection: 15679. Date: 7 Aug. 1941. Abundance: V, D. Distribution: Wasatch Mts., Utah; Mt. Shasta.

Hysterangium phillipsii Harkn. — Collection: 13263. Date: 26 June 1939. Abundance: V, D. Distribution: Oregon, California; Mt. Shasta.

Hsterangium separabile Zeller. — Collection: 13374. Date: 31 July 1939. Abundance: V, D. Distribution: Europe, North and South America, Mt. Shasta.

Lycoperdales.

Lycoperdaceae.

Bovista pila Berk. & Curt. — Collected on Shasta fir duff in the Horse Camp area, 8000 feet.
Collections: 14609, 14611. Date: 14 Aug. 1940. Abundance: V, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Canada, United States; Mt. Shasta.

Calvatia craniiformis (Schw.) Fr. — A sterile base assigned to this species was found under pines near timberline on the north side of the mountain.
Collection: 25702. Date: 26 Aug. 1949. Abundance: V, D. Associates: *Pinus ponderosa, Pinus albicaulis*. Distribution: North America, Mt. Shasta.

Calvatia fumosa Zeller. — On the ground under Shasta firs and mountain hemlock, 7500—8500 feet.
Collections: 15522, 15630, 15778, 16799, 18003, 18110, 18190, 18413, 20003, 20037, 20049, 20050, 20080, 20131, 20228, 20287, 20335, 28291. Dates: 27,

28 July, 16 Sept. 1941; 7 Sept. 1942; 17, 28 June, 10 July, 29 Aug. 1946; 17, 20, 22, 25 June, 10, 18 July 1947; 3 July 1951. Abundance: III, D. Associates: *Abies magnifica* var. *shastensis, Tsuga mertensiana.* Distribution: Wyoming, Washington, Oregon, Mt. Shasta.

Calvatia sculpta Harkn. — Observed on or near rotting Shasta fir wood and on duff and litter in Shasta fir and white fir forests between Horse Camp and Wagon Camp.
Collections: 10237, 13325, 20298, 20299. Dates: 22 July 1938, 7 July 1939, 18 July 1947. Abundance: IV, D. Associates: *Abies magnifica* var. *shastensis, Abies concolor.* Distribution: Cascade range in Washington and Oregon, montains of California; Mt. Shasta.

Calvatia subcretacea Zeller. — Occasional on litter in Shasta fir woods.
Collections: 8661, 10222, 10238, 10272, 14641, 15650, 15665, 15742, 18011, 18111, 18153, 18270, 18414, 20014, 20051, 20336. Dates: 24 Aug. 1937; 18, 22 July, 12 Aug. 1938; 8 July 1940; 29 July, 7, 18 Aug. 1941; 21, 28 June, 2, 19 July, 29 Aug. 1946; 20 June, 18 July 1947. Abundance: III, D. Associates: *Abies magnifica* var. *shastensis, Abies concolor.* Distribution:

Geastraceae.

Geastrum coronatum (Schaeff.) Schroet. — Found on soil in a patch of chaparral in the Sierra Mixed Conifer zone at about 5500 feet.
Collection: 15525. Date: 27 June 1941. Abundance: V, D. Associates: *Pinus ponderosa, Arctostaphylos patula.* Distribution: Africa, Europe, Mt. Shasta.

Geastrum mammosum Pers. — On sandy soil in the chaparral along the old Sisson Southern Trail at about 4000 feet.
Collection: 19301. Date: 7 April 1941. Abunddance: IV, D. Associates: *Arctostaphylos patula, Ceanothus velutinus.* Distribution: Europe, North America; Mt. Shasta.

Mycenastraceae.

Calbovista subsculpta Morse. — On ground at Bear Springs, Wagon Camp and near Squaw Valley Creek just above McCloud, 4000—5700 feet. Reported by Miss Morse from Mount Shasta.
Collections: 18012, 19361, 20325. Dates: 21 June 1946; 8 April, 18 July 1947. Abundance: IV, D. Associates: Plants of the Sierra Mixed Conifer and White Fir zones. Distribution: Western North America.

Mesophelliaceae.

Abstoma reticulatum Cunn. — One collection of this hypogaeous species was made near Horse Camp in Shasta fir duff.
Collection: 14642. Date: 8 June 1940. Abundance: V, D. Associate: *Abies magnifica* var. *shastensis.* Distribution: Australia, California; Mt. Shasta.

Sclerodermatales.

Astraeaceae.

Astraeus hygrometricus (Pers.) Morg. — Sterile stellate exoperidia of a fungus corresponding to the exoperidia of this species have been collected in the Cascade Gulch area between 5000 and 7000 feet, and along the Sisson Southern Trail between 7000 and 7500 feet. Mature fruit bodies have been found along the Old Military Highway on the north side of the mountain.

Collections: 8682, 10119, 13251, 18238, 18359, 19406, 19417, 20248. Dates: 3 Sept. 1937; 17 June 1938; 14 June 1939; 12 July, 10 Aug. 1946; 9 April, 10 July 1947. Abundance: IV, D. Associates: *Abies concolor, Abies magnifica* var. *shastensis; Arctostaphylos patula, Purshia tridentata.* Distribution: Cosmopolitan; Mt. Shasta.

Astraeus pteridis (Shear) Zeller. — Found along the Sisson Southern Trail at 4000 feet in the chaparral, and at 7000 feet in the Shasta fir zone.

Collections: 19291, 20399. Dates: 7 April, 8 Aug. 1947. Abundance: V, D. Associates: *Arctostaphylos patula, Ceanothus velutinus; Abies magnifica* var. *shastensis.* Distribution: Washington, Oregon, Mt. Shasta.

Sclerodermataceae.

Pompholyx occidentale Zeller. — Collections have been obtained from under Shasta fir duff near Horse Camp in the Shasta Fir zone at 8000 feet, and from the forested alluvial area of Mud Creek Canyon above Mud Creek Dam in the Sierra Mixed Conifer zone at 5500 feet.

Collection: 20354. Date: 25 July 1947. Abundance: V, D. Distribution: 2 July 1942. Abundance: IV, D. Associates: *Abies magnifica* var. *shastensis; Pinus ponderosa, Abies concolor, Pseudotsuga taxifolia.* Distribution: Known only from these collections.

Scleroderma bovista Fr. — In a garden at Mount Shasta, 3550 feet.

Collection: 20354. Date: 25 July 1947. Abundance: V, N. Distribution: Africa, Australia, Europe, North & South America; Mt. Shasta.

Scleroderma cepa Fr. — On the ground in a lawn at Mount Shasta, 3550 feet.

Collection: 15766. Date: 28 Aug. 1941. Abundance: V, D. Distribution: Cosmopolitan; Mt. Shasta.

Scleroderma hypogaeum Zeller. — In a garden at Mount Shasta.

Collection: 15765. Date: 21 Aug. 1941. Abundance: V, D. Distribution: Western Washington and Oregon, Mt. Shasta.

Sedeculaceae.

Sedecula pulvinata Zeller. — One collection was made of several specimens buried in the soil under Shasta fir duff in Cascade Gulch below Horse Camp in the Shasta Fir zone at about 7500 feet; one specimen was found on the floor of Mud Creek Canyon above Mud Creek Dam; one specimen was found near timberline on the north side of the mountain east of Bolam Creek at about 8500 feet. Collections: 10307, 14667, 25699. Dates: 10 Sept. 1938, 28 July 1940, 26 Aug. 1949. Abundance: IV, D. Associates: *Abies magnifica* var. *shastensis; Abies concolor, Pseudotsuga taxifolia, Pinus ponderosa; Pinus albicaulis.* Distribution: Known only from these collections.

Tulostomataceae.

Tulostoma tuberculatum White. — One collection of a half dozen specimens was made in a sandy hill along the Sisson Southern Trail just above the cut-off to the spring, Shasta Fir zone at about 6500 feet.
Collection: 14614. Date: 18 June 1940. Abundance: V, D. Associates: Both species of *Abies, Ceanothus velutinus.* Distribution: British Columbia, Colorado, Mt. Shasta.

Nidulariales.

Nidulariaceae.

Crucibulum levis (DC.) Kambly & Lee. — One collection was made at Horse Camp of a number of specimens growing on bits of possibly Shasta fir wood in the turf area at the water system. Also found on wood of *Pinus attenuata* along the Mud Creek Dam road above McCloud.
Collections: 15702, 19337, 19347. Dates: 8 Aug. 1941, 8 April 1947. Abundance: IV, A. Associates: *Abies magnifica* var. *shastensis; Pinus attenuata, Libocedrus decurrens.* Distribution: Cosmopolitan, Mt. Shasta.

Podaxales.

Secotiaceae.

Cyttarophyllum cucullata (Seaver & Shope) Singer. — Collected on moist soil along the upper Wagon Camp Creek. The specimens were scattered along a hundred feet of moist bank and looked like opening agaric buds.
Collections: 13254, 13320, 13334, 14647, 15700, 20317. Dates: 16 June, 7, 13 July 1939; 5 July 1940; 8 Aug. 1941; 18 July 1947. Abundance: IV, D. Associates: *Abies concolor, Abies magnifica* var. *shastensis.* Distribution: Colorado, Mt. Shasta.

Cyttarophyllum polytrichoides (Zeller) Singer. — Found during most years in the sod near the "well" of the Horse Camp spring. From there it has apparently migrated, possibly by

being carried in the water, to the small turf formed at the Shasta Alpine Lodge. There, rather than being scattered among the rush and grass plants, it was gregarious, more than 100 specimens having been collected at one time in each of two small patches. Two specimens were obtained once in wet sod along Squaw Valley Creek at 7800 feet. Collections: 8607, 13313, 13361, 14718, 15701, 15752, 18315, 20260, 20265, Exs. 136. Dates: Aug. 1936; 20 July 1937; 5, 20 July 1939; 8 Aug. 1940; 8, 24 Aug. 1941; 30 July 1946. Abundance: III, D. Associates: *Juncus orthophyllus, Campanula wilkinsiana.* Distribution: Known only from Mt. Shasta.

Longula texensis (B. & C.) Zeller. — On the ground along the Sisson Southern Trail in the White Fir zone at about 6000 feet. Collections: 18271, 20407. Dates: 19 July 1946, 8 Aug. 1947. Abundance: V, D. Associate: *Abies concolor.* Distribution: Texas, New Mexico, California, Oregon; Mt. Shasta.

Montagnea arenaria (DC.) Zeller. — Twenty specimens were found in 1940 on a sandy hill along the lane leading from Andesite Station to the Military Pass. The conditions at this point are as near desert-like as can be found on the moutain. This area lies on the north side of the mountain. It was found again in 1941 in the same habitat.

Collections: 14602, 15514. Dates: 4 June 1940, 12 June 1941. Abundance: IV, D. Associates: *Cercocarpus ledifolius, Purshia tridentata.* Distribution: Transcaucasia, North Africa, Mexico, Texas, New Mexico, Arizona, Oregon, California; Mt. Shasta.

Secotium nubigenum Harkn. ex Zeller. — Frequent on rotten Shasta fir logs and on piles of brown remains of Shasta fir logs and stumps in the Shasta Fir zone. At one point near Horse Camp at 7800 feet where a number of Shasta fir logs have reached a very advanced stage of decay in a very large grove of trees, 30—40 specimens at a time have been obtained from logs from which the snow had just melted. In 1946 in a few square feet 85 specimens were found on duff, litter and logs. Frequently specimens are found on logs and rocks apparently set out to dry by squirrels. Occasionally near snow banks the specimens will penetrate through the snow or will flourish in hollows under the snow from which the snow has already melted.

Collections: 10163, 10174, 10182, 10209, 14605, 14610, 14618, 14646, 15534, 15542, 15552, 15528, 15561, 15572, 15640, 15649 15664, 15759, 18004, 18026, 16798, 18148, 18215, 20066, 20133, 24044, 24067, 28241, 28290, 28315, 28316, 28317, 28341, Exs. 78, 78-A. Dates: 29 June, 1, 6, 15 July 1938; 10, 14 June, 3, 8 July 1940; 3, 9, 12, 14, 16, 18, 26, 29 July, 7, 28 Aug. 1941; 7 Sept. 1942; 19, 23 June, 2, 10 July 1946; 22, 25 June 1947; 3, 4 July

1946; 1, 3, 4 July 1951. Abundance: I, A, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Northern California, Mt. Shasta.

Secotium pingue Zeller. — Collected once in a rotten Shasta fir log near Horse Camp.
Collection: 13362. Date: 25 July 1939. Abundance: V, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: Mt. Baker, Mt. Rainier, Olympic Mts., Washington; Mt. Shasta.

Fungi Imperfecti.

Phomales.

Phomaceae.

Aposphaeria mollis (Lév.) Sacc. — Collected once on overwintered culms of *Juncus parryi* at Horse Camp.
Abundance: V, C. Associate: *Abies magnifica* var. *shastensis*. Distribution: France; Mt. Shasta.

Ascochyta pisi Lib. — A heavy infection associated with *Uromyces fabae* was found in 1941 on *Lathyrus lanzswertii* var. *aridus* at MacBride Springs, 5000 ft. Exs. 140.
Abundance: V, C. Associates: *Purshia tridentata, Ceanothus velutinus, Arctostaphylos patula.*

Botryosphaerostroma visci (Sollm.) Petrak. — On *Phoradendron libocedri.* — On fallen branches of the host under incense cedars along the Mud Creek Dam road above McCloud, 4000 feet.
Collection: 19351. Date: 8 April 1947. Abundance: V., C. Associates: *Libocedrus decurrens, Pinus ponderosa, Abies concolor.*

Coniothyrium fuckelii Sacc. — Isolated from soils as indicated in the table.

Cystospora eriogonii W. B. Cke. — On *Eriogonum pyrolaefolium.* — On dead underground stems in talus slopes between the Summit Trail and South Ridge above Horse Camp at about 9000 feet.
Collection: 25631 (type). Date: 12 Aug. 1947. Abundance: V, C. Associates: None in the immediate vicinity. Distribution: Known only from this collection.

Darluca filum (Biv.) Cast. — Associated with the following rusts: *Puccinia rubigo-vera* on *Holcus lanatus* along an irrigation ditch near Mount Shasta, 3500 feet, June 1941. — *Uromyces fabae* on *Lathyrus lanzswertii* var. *aridus* at MacBride Springs, 5000 feet, 1941. — *Puccinia atrofusca* on *Carex whitneyi* along the Shasta Snowline Highway at about 5500 feet. Abundance: IV, F. Distribution: Europe, Africa, Ceylon, North America; Mt. Shasta.

Diplodia lupini Cke. & Harkness. — On *Lupinus obtusilobus.* — On occasional leaves on plants found between 7000—8000 feet on the north side of the mountain.
Collection: 25692. Date: 26 Aug. 1949. Abundance: V, C. Associates:

Pinus ponderosa, Abies magnifica var. *shastensis.* Distribution: California, Mt. Shasta.

Diplodia veratri Earle. — On *Veratrum californicum.* — On rotting stems on swampy ground along Squaw Valley Creek in Shasta fir woods at about 7500 feet.
Collection: 20267. Date: 10 July 1947. Abundance: V, C. Associates: *Abies magnifica* var. *shastensis, Allium validum.* Distribution: Western North America; Mt. Shasta.

Diplodina silenes W. B. Cke. — On *Silene douglasii* var. *douglasii.* — On the north side of the mountain east of Bolam Creek on smutted plants.
Collection: 25660-B. Date: 26 Aug. 1949. Abundance: IV, C. Associates: *Abies concolor, Pinus ponderosa.* Distribution: Known only from this collection.

Dothiorella magnifructa (Pk.) Petrak & Sydow. — On *Libocedrus decurrens.* — On cones on the ground under trees along the Mud Creek Dam road.
Collection: 19336, Exs. 276. Date: 8 April 1947. Abundance: IV, A. Associates: *Pinus attenuata, Pinus ponderosa.*

Hendersonia distans Brun. — Collected on overwintered leaves of a sedge at Horse Camp. Abundance: V, C. Associate: *Abies magnifica* var. *shastensis.* Distribution: France; Mt. Shasta.

Hendersonia spp. — Collected on overwintered leaves of *Agrostis thurberiana* and on overwintered stems and sheaths of *Veratrum californicum.*

Kellermannia alpina Ell. & Ev. — See *Heteropatella umbilicata.*

Macrophoma chrysothamnii. W. B. Cke. — On *Chrysothamnus nauseosus* var. *occidentalis.* — Along a lane above Bolam Station at about 5500 feet.
Collection: 25671 A. Date: 26 Aug. 1949. Abundance: IV, B. Associates: *Pinus ponderosa, Artemisia tridentata.* Distribution: Known only from this collection.

Macrophoma cylindrospora (Desm.) Berk. & Vogl. — See *Lophodermium phloxii* Bonar *& W.* B. Cke.

Naemosphaera shastensis Sprague & W. B. Cke. — On *Streptanthus orbiculatus.* — Collected on a number of overwintered stems of this annual host at the lower part of the Horse Camp spring area. Unless the host plant occurred near or in running water this species was not found on it. On the south wall of Cascade Gulch at about 9000 feet in the White Bark Pine zone on open talus slopes most overwintered portions of this herb were found covered with this fungus in 1947.
Collections: 8542, 8578, 8589, 20481, 28303, Exs. 277. Dates: 29 June,

12, 20 July 1937; 28 August 1947; 2 July 1951. Abundance: IV, C. Associates: *Mimulus tilingii, Luzula subcongesta; Eriogonum marifolium, Polygonum shastense, Pinus albicaulis.* Distribution: Known only from these collections.

Phoma caricis (Fr.) Sacc. — On *Carex brewerii.* — On dead leaves around base of widely scattered clumps on ridge north of Horse Camp at about 10,000 feet.
Collection: 18248. Date: 16 July 1946. Abundance: V, C. Distribution:

Phoma eriogoni W. B. Cke. — On *Eriogonum marifolium.* — On occasional plants in South Gate, 8000 feet.
Collection: 25630 (type). Date: 26 Aug. 1949. Abundance: IV, C. Associates: *Eriogonum pyrolaefolium, Polygonum shastense.* Distribution: Known only from this collection.

Phoma harknessii Sacc. — Collected once on dead pieces of wood of *Pinus albicaulis.* Abundance: V, C. Associate: The host. Distribution: California; Mt. Shasta.

Phoma herbarum Westd. — This species occurred on overwintering remains of *Castilleja arachnoidea* var. *shastense* collected at Horse Camp in 1937 and 1946. In 1946 it was also found on *Carex breweri* at 9000 feet in Cascade Gulch and at 9500 feet on ridges north of Horse Camp, as well as on *Juncus parryi* at Horse Camp at 8000 feet.
Collections: 18090, 18198. Dates: 1937; 27 June, 10 July 1946. Abundance: III, C. Associates: Plants of the timberline area. Distribution: On at least 16 monocot and dicot species in Siberia, Europe, America, Mt. Shasta.

Phoma herbicola Wehmeyer. — On *Carex breweri.* — On dead leaves around plants on a ridge north of Horse Camp.
Collection: 18378. Date: 26 Aug. 1946. Abundance: V, C. Distribution: Wyoming, Mt. Shasta.

Phoma spp. — On *Castilleja arachnoidea* var. *shastense, Arnica viscosa, Lupinus albicaulis* var. *shastensis.* — In the Horse Camp area at timberline, 8000 feet, and in Shasta fir forest along the Horse Camp-Wagon Camp trail, 7500 feet.
Collections: 18007, 18197, 20219. Dates: 21 June, 10 July 1946; 2 July 1947. Abundance: V, C. Associates: *Eriogonum marifolium, Polygonum shastense; Abies magnifica* var. *shastense.*

Phoma sp. — On Shasta fir bark on a tree along the Sisson Southern Trail at 7500 feet.
Collection: 18355. Date: 10 Aug. 1946. Abundance: V, A.

Phyllosticta amicta Ell. & Ev. — On *Arctostaphylos nevadensis* Gray. — Forming spots on parts or all of 182 out of 500 of the small sclerophyllous leaves on a branch of this shrub along the Sisson Southern Trail about a half mile below Horse Camp; and on a ridge between Horse Camp and Wagon Camp.

Collections: 8595, 16804, Exs. 51. Dates: 28 July 1937, 8 Sept. 1942. Abundance: IV, B. Associate: *Abies magnifica* var. *shastensis*. Distribution: On at least three species of *Arctostaphylos* in Oregon and California; Mt. Shasta.

Phyllosticta caricis (Fckl.) Sacc. — Forming minor spots on leaves of *Carex bolanderi* in a colony near Horse Camp. Abundance: V, C. Associates: *Abies magnifica* var. *shastensis, Pinus albicaulis*. Distribution: On at least four carices in Europe, Wisconsin, New York, Mt. Shasta.

Phyllosticta crustosa Bonar & W. B. Cke. — On *Kelloggia galioides*. — Seen every year along the Sisson Southern Trail, 4000—6000 feet. Mature material was not collected until 1947. Collection: 20471 (type). Date: 22 Aug. 1947. Abundance: IV, C. Associates: Trees of the White Fir and Sierra Mixed Conifer zones. Distribution: Plumas Co., California, and Mt. Shasta.

Phyllosticta ferax Ell. & Ev. — On *Lupinus albicaulis* var. *shastensis*. — Covering all leaves of entire plants or only a few leaves of individual plants in a colony of the host along the Sisson Southern Trail near the upper end of the Horse Camp-Wagon Camp Trail. Also in a Shasta fir forest between Horse Camp and Panther Creek meadows.
Collections: 13405, 20443, Exs. 52. Dates: 22 Aug. 1939, 15 Aug. 1946. Abundance: III, C. Associate: *Abies magnifica* var. *shastensis*. Distribution: On more than 4 species of *Lupinus* in western North America; Mt. Shasta.

Phyllosticta fritillariae Bonar & W. B. Cke. — On *Fritillaria atropurpurea*. Blackening and killing three plants of the host at Wagon Camp.
Collection: 15583 (type). Date: 18 July 1941. Abundance: V, C. Associates: *Abies concolor, Abies magnifica* var. *shastensis*. Distribution: Eastern Washington, Mt. Shasta.

Phyllosticta melanoplaca Thuem. — On *Veratrum californicum*. — With *Cylindrosporium* on leaves of a large host colony at Wagon Camp.
Collection: 20320. Date: 18 July 1947. Abundance: IV, C. Associates: Both species of *Abies, Libocedrus decurrens*. Distribution: Siberia, Europe, Mt. Shasta.

Phyllosticta monardellae W. B. Cke. — *On Monardella odoratissima*. — Not forming spots but blackening the entire leaf on most of the leaves of plants above Wagon Camp in Shasta fir woods.
Collections: 13404, Exs. 70. Dates: 22 Aug. 1939. Abundance: IV, C. Associate: *Abies magnifica* var. *shastensis*. Distribution: Known only from this collection.

Phyllosticta nigrescens Bonar & W. B. Cke. — On *Viola purpurea.* — Not forming spots but blackening entire leaves or parts of leaves on portions of, or on entire plants, in Shasta fir woods above Wagon Camp along the Horse Camp-Wagon Camp Trail.
Collections: 13403 (type), 20327, Exs. 281. Dates: 22 Aug. 1939, 11 July 1947. Abundance: IV, C. Associates: *Abies magnifica* var. *shastensis.* Distribution: Grouse Mt., Humbolt Co., California; Mt. Shasta.

Placosphaeria shastensis Sprague & W. B. Cke. — On *Monardella odoratissima.* — On overwintered stems and peduncles at Horse Camp.
Collection: 8509 (Type), Exs. 31. Date: 24 June 1937. Abundance: V, C. Associate: *Abies magnifica* var. *shastensis.* Distribution: Known only from this collection.

Rhynchostoma exasperans Karst. — On overwintered herbage of *Lupinus obtusilobus* at Horse Camp.
Abundance: V, C. Associate: *Abies magnifica* var. *shastensis.* Distribution: Finland, Mt. Shasta.

Selenophoma linicola T. C. Vanterpool. — On *Iliamna bakeri.* — On exfoliating epidermis of woody stems in the chaparral along the Shasta Snowline Highway about 4500 feet.
Collection: 18233. Date: 12 July 1947. Abundance: IV, C. Associates: *Arctostaphylos patula, Ceanothus velutinus.* Distribution: Saskatchewan, Mt. Shasta.

Selenophoma donacis Sprague & A. G. Johnson. — This species occurs occasionally on a few or most of the leaves on clumps of *Elymus glaucus, Elymus hansenii* and *Elymus elymoides.* It has been found between 5000 and 9000 feet on the mountain. It is commonest on *Elymus elymoides* and is found frequently at Horse Camp (8000 feet) on most of the clumps of this species in most years.
Collections: 18256, 18257 (and other years). Dates: 16 July 1946 and most years. Abundance: III, C. Associates: *Abies magnifica* var. *shastensis, Abies concolor, Pinus ponderosa, Pinus albicaulis, Libocedrus decurrens.* Distribution: Western North America; Mt. Shasta.

Septoria aromatica Kabát & Bubák. — On *Ligusticum grayi.* — Collected in Squaw Valley Creek meadows along the creek at about 8000 feet, and on the lower part of Panther Creek at 6500 feet.
Collections: 20441. Date: 1941; 15 Aug. 1947. Abundance: V, C. Associates: *Abies magnifica* var. *shastensis, Tsuga mertensiana, Phyllodoce empetriformis.* Distribution: Bohemia; Mt. Shasta.

Septoria astragali Rob. & Desm. — On *Lathyrus lanzswertii* var. *aridus.* — Found in the Wagon Camp meadows, 5700 feet.
Collection: 20433. Date: 15 Aug. 1947. Abundance: V, C. Associates: Both species of *Abies, Libocedrus decurrens.* Distribution: Europe, Mt. Shasta.

Septoria curvispora Ell. & Ev. — On *Acer glabrum.* — Collected on leaves of this host by W. C. Blasdale, Aug. 1894, and distributed in Ellis and Everhart: Fungi Columbiani No. 773. Also issued as No. 3270 in North American Fungi where it was cited as a variety of *S. circinata* Ell. & Ev.

Septoria lunelliana Sacc. — On *Carex fracta.* — On previous years leaves on large clumps at MacBride Springs, 5000 feet. Collection: 20226, Exs. 278. Date: 3 July 1947. Abundance: IV, C. Associates: *Pinus ponderosa, Libocedrus decurrens.* Distribution: North Dakota; Mt. Shasta.

Septoria marginata Heald & Wolf. — On *Acer glabrum.* — Occasional in one year on a tangle of host trees along Squaw Valley Creek at about 5500 feet in the Sierra Mixed Conifer zone. This species is considered synonymous with *S. aceris* (Lib.) Berk. & Br. by Gilmen and Archer.
Collection: 14678, Exs. 75. Date: 8 Aug. 1940. Abundance: IV, B. Associates: *Pinus ponderosa, Pinus lambertiana, Abies concolor, Pseudotsuga taxifolia.* Distribution: Western North America; Mt. Shasta.

Septoria minuta Schroet. — On *Luzula subcongesta.* — Found once on several clumps in Panther Creek Meadows.
Collection: 25638. Date: 25 Aug. 1949. Abundance: V, C. Associates: *Phyllodoce empetriformis, Kalmia polifolia, Allium validum.* Distribution: Greenland, Oregon, Mt. Shasta.

Septoria nodorum (Berk.) Berk. — On *Melica californica.* — The *Ascochyta* stage of this species was common on this grass around Wagon Camp meadows.
Collection: 20432, Exs. 279. Date: 15 Aug. 1947. Abundance: IV, C. Associates: *Stipa occidentalis, Elymus hansenii,* both species of *Abies.* Distribution: Cosmopolitan with the hosts; Mt. Shasta.

Septoria oudemannsii Sacc. — (*Ascochyta oudemannsii* (Sacc.) Sprague & A. G. Johnson). — On *Poa pratensis.* — Found on several leaves of a clump at Horse Camp. Abundance: V, C. Associate: *Abies magnifica* var. *shastensis.* Distribution: Western North America; Mt. Shasta.

Septoria pruni Ell. — On *Prunus demisa.* — Common on a colony of these shrubs in the chaparral along the Shasta Snowline Highway.
Collection: 15603, Exs. 137. Date: 25 July 1941. Abundance: IV, B. Associates: *Arctostaphylos patula, Ceanothus velutinus.* Distribution: North America, Mt. Shasta.

Septoria shastensis Bonar & W. B. Cke. — On *Aster shastensis.* — A colony of this host along the Snowline Highway in the chaparral was completely covered by this species — leaves, petioles, stems, were completely infected.

Collection: 15601 (type), Exs. 153. Date: 25 July 1941. Abundance: IV, C. Associates: *Arctostaphylos patula, Ceanothus velutinus.* Distribution: Known only from this collection.

Septoria variegata Ell. & Ev. — On *Rhamnus purshiana.* — Collected by W. C. Blasdale, Aug. 1894, at Shasta Springs, and distributed in Ellis and Everhart, North American Fungi No. 3275, and Fungi Columbiani No. 778.

Septoriella sp. — One collection of overwintered remains of *Lupinus obtusilobus* had on it a few fruit bodies of a fungus referred to this genus.

Stagonospora simplicior Sacc. & Berl. — On *Stipa columbiana* var. *nelsonii.* — Reported by Sprague in Mycologia *42*: 762—3. 1950.

Stagonospora sp.—Found once on chips of Shasta fir in the Horse Camp woodpile.

Sphaeropsis arctostaphylii (Vize) Sacc. — On *Arctostaphylos nevadensis.* — On shrubs on a ridge between Horse Camp and Panther Creek meadows in the Shasta Fir zone.
Collection: 16804. Date: 8 Sept. 1942. Abundance: V, B. Associate: *Abies magnifica* var. *shastensis.* Distribution: California; Mt. Shasta.

Sphaeropsis microscopicum Tassi. — Collected once at Horse Camp in 1937 on overwintered remains of *Castilleja arachnoidea* var. *shastensis.*

Excipulaceae.

Heteropatella conglutinata (Ell. & Ev.) Nannf. — On *Gilia aggregata* (Pursh) Spreng. — Collected on dead stems on Mt. Shasta, 15 Aug. 1903, by E. B. Copeland. Determined by Ellis and distributed by Ellis and Everhart in North American Fungi No. 3735.

Heteropatella umbilicata (Pers.) Jaap. — On *Agoseris gracilens, Aster shastensis, Castilleja arachnoidea* var. *shastensis, Castilleja miniata, Juncus* sp., *Ligusticum grayi, Monardella odoratissima, Pentstemon gracilentus.* — Sometimes alone and sometimes in association with various species of *Leptosphaeria* and *Pleospora,* among others, this species occurs on overwintered herbage as described under *Leptosphaeria.* While the *Kellermannia alpina* stage is common, the ascigerous stage (*Heterosphaeria*) has not yet been obtained.

Collections: Found in at least five collections made between 1937 and 1940; 18094, 18197, 20284, 20442, 20444, Exs. 28-A. Dates: 1937—1940; 27 June, 10 July 1946; 10 July, 18 Aug. 1947. Abundance: II, C. Associates: Herbaceous plants of the timberline and upper Shasta Fir zone regions. Distribution: On at least 22 species of dicots, panarctic, Afghanistan, Colorado, Wyoming, California; Mt. Shasta.

Sirexcipula wyomingensis Wehm. — On *Arabis platysperma, Saxifraga tolmiei.* — On the former host in open places, on colonies of the latter in niches of lava rocks on the west side of Shastina between 9000 and 9500 feet in the upper White Bark Pine zone.
Collections: 20478, 25584. Dates: 28 Aug. 1947, 24 Aug. 1949. Abundance: V, C. Associate: *Pinus albicaulis.* Distribution: Wyoming, Mt. Shasta.

Leptostromataceae.

Leptostromella hysterioides f. *graminicolum* (de Not.) Sacc. — On *Elymus elymoides.* — On dead leaves around a clump along the ridges north of Horse Camp at about 9500 feet.
Collection: 18256. Date: 16 July 1946. Abundance: V, C. Distribution: Italy, Mt. Shasta.

Thyrenula sp. — On fallen needles of *Pinus attenuata* at McCloud Summit on the south flank of Mt. Shasta at 4000 feet along State Route 89.
Collection: 18294. Date: 25 July 1946. Abundance: IV, A. Associates: *Pinus attenuata, Arctostaphylos patula, Ceanothus velutinus.*

Nectrioidaceae.

Nectriella sp. — On *Castilleja arachnoidea* var. *shastensis.* — Collected once at Horse Camp on overwintered herbage.
Collection: 18313. Date: 30 July 1946. Abundance: V, C. Associates: *Polygonum shastense, Eriogonum marifolium.*

Ollula pezizoidea Lév. — Collected once at Horse Camp on two dead twigs of Shasta fir.
Collection: 15726. Date: 18 Aug. 1941. Abundance: V, A. Associate: *Abies magnifica* var. *shastensis.* Distribution: Spain, Mt. Shasta.

Melanconiales.

Melanconiaceae.

Cryptostictis arbuti (Bonar) Zeller. — Occasional on *Arctostaphylos patula* in the chaparral and infrequent on *Arctostaphylos nevadensis* in the Shasta Fir zone.
Collections: 8567, 8526, 8592. Dates: 26 June, 9, 23 July 1937; seen every year since and collected once in 1941. Abundance: IV, B. Associates: Chaparral shrubs and *Abies magnifica* var. *shastensis.* Distribution: Oregon, California; Mt. Shasta.

Cylindrosporium rhamni Ell. & Ev. — The type was collected on leaves of *Rhamnus* sp. at Shasta Springs by W. C. Blasdale, No. 283, possibly in Aug. 1894.

Cylindrosporium smilacinae Ell. & Ev. — On *Smilacina stellata.* — Found only once at Wagon Camp and then blackening leaves on a large colony.
Collection: 20315. Date: 18 July 1947. Abundance: IV, C. Associates:

Libocedrus decurrens, Veratrum californicum. Distribution: Idaho, Mt. Shasta.

Cylindrosporium veratrinum Sacc. & Wint. — On *Veratrum californicum.* — Collected only once at Wagon Camp at a time when it caused a heavy infection blackening many leaves in a large colony. It may have been passed up in other years when heavy insect infestations occurred on these plants; also on leaves of plants in the lower part of Panther Creek Meadows.

Collections: 20320, 25639. Dates: 18 July 1947, 25 Aug. 1949. Abundance: IV, C. Associates: *Libocedrus decurrens, Smilacina stellata, Abies magnifica* var. *shastensis, Allium validum.* Distribution: Switzerland, Mt. Shasta.

Gloeosporium pteridis Harkn. — On *Pteridium aquilinum* var. *pubescens.* — Found on a number of fronds in the Wagon Camp area at 5700 feet, as well as in the chaparral near Howard at 4200 feet and in the chaparral above McCloud on the south side of the mountain at 4000 feet. The perfect state was found once at Wagon Camp (see *Cryptomycina pteridis*).

Collections: 10258, 13347, 18278, 20430, Exs. 29. Dates: 29 July 1938; 21 July 1939, 27 July 1946; 15 Aug. 1947. Abundance: III, C. Associates: *Arctostaphylos patula, Ceanothus velutinus.* Distribution: North America, Mt. Shasta.

Marssonina potentillae (Desm.) Magn. — On *Potentilla glandulosa* ssp. *nevadensis.* — Where the host occurs along streams this species is found occasionally on it. It was collected once at a small spring above Wagon Camp and has been found occasionally at MacBride Springs.

Collections: 14625, 15607, 20225, Exs. 124. Dates: 5 July 1940, 25 July 1941, 3 July 1947. Abundance: IV, C. Associates: *Abies magnifica* var. *shastensis; Libocedrus decurrens, Pinus ponderosa.* Distribution: Western North America, Mt. Shasta.

Pestalotia sp. — On *Phacelia leucophylla* Torr. — On dead stems of overwintered herbage in chaparral near MacBride Springs. Collection: 18275. Date: 12 July 1946. Abundance: V, C. Associates: *Arctostaphylos patula, Ceanothus velutinus.*

Moniliales.

Moniliaceae.

Acremonium ?verticellatum Lk. — Found as a pink mold on hand hewn boards of Shasta fir and on ponderosa pine boards at Horse Camp, 8000 feet.

Collection: 18036. Date: 24 June 1946. Abundance: V, A. Distribution: Widespread in soils; Mt. Shasta.

Botrytis cinerea Pers. ex Fr. — On *Veratrum californicum* Durand. — Appearing as gray masses on dead stems at Panther Creek Meadows.
Collection: 28327. Date: 2 July 1951. Abundance: IV, C. Associates: Both species of *Abies, Libocedrus decurrens.* Distribution: Cosmopolitan, Mt. Shasta.

Cephalosporium sp. — Isolated from soil samples.

Chromosporium sp. — Pink pustules were found on dead leaves of *Cryptogramma acrostichoides.* Collected once, observed several times.
Collection: 18322. Date: 30 July 1946. Abundance: IV, C. Associate: *Athyrium americanum.*

Diplocladium majus Bon. — On *Armillaria zelleri.* — Several specimens in the colony of the host reported above were infected with this mold.
Collection: 26998. Date: 28 Sept. 1950. Abundance: V, F. Associate: *Abies magnifica* var. *shastensis.* Distribution: Europe, North America, Mt. Shasta.

Oidium mangisporum Linder. — Collected once on rotten Shasta fir wood at Horse Camp. — Abundance: V, A. Associate: The host. Distribution: Known only from this collection.

Ovularia lotophaga Ell. & Ev. — On *Lotus torreyi.* — The type of this species was collected at Sisson, July 1894, by W. C. Blasdale, No. 288.

Ramularia delphinii Jaap. — On *Delphinium pauciflorum.* — Collected once on several plants in the dry woodland below Wagon Camp. Not observed since the first collection was made.
Collection: 8574. Date: 9 July 1937. Abundance: V, C. Associates: Both species of *Abies.* Distribution: Switzerland; Mt. Shasta.

Ramularia mimuli Ell. & Ev. — On *Mimulus tilingii.* — A large collection was made of plants rather completely covered with this pathogen in a spring above Horse Camp. Also found in Panther Creek meadows. Infected colonies are different from the healthy colonies in size and color. On some leaves pycnidial initials may be indicated by hyphal knots present.
Collections: 16692, 18426, 20448, Exs. 221. Dates: 8 Sept. 1942; 29 Aug. 1946; 15 Aug. 1947. Abundance: IV, C. Associates: *Juncus mertensianus; Mitella pentandra, Abies magnifica* var. *shastensis.* Distribution: Western United States, Mt. Shasta.

Ramularia obducens Thüm. — On *Pedicularis densiflora.* — Collected along a roadside in Mount Shasta. This is the type locality and it is possible that the type collection was made from plants near the one producing this collection. More than 20 leaves were infected.

Collections: Blasdale; 15502, Exs. 148. Dates: 28 July 1894, 7 June 1941. Abundance: V, C. Associates: *Libocedrus decurrens, Pinus ponderosa.* Distribution: Germany, Latvia, Mt. Shasta.

Ramularia nivosa (Ell. & Ev.) W. B. Cke. & C. G. Shaw. — On *Pentstemon shastensis.* — Found on most of the leaves of several host plants at Wagon Camp.
Collection: 20307 (type of *Ramularia pentstemonis* W. B. Cke.). Date: 18 July 1947. Abundance: IV, C. Associates: Both species of *Abies, Libocedrus decurrens.* Distribution: Eastern Washington, Mt. Shasta.

Ramularia claytoniae W. B. Cke. — On *Claytonia siberica.* — Found once on a few plants near the Big Springs in the McCloud River southeast of McCloud ,about 3500 feet.
Collection: 18279. Date: 25 July 1946. Abundance: V, C. Associate: *Pinus ponderosa.* Distribution: Known only from this collection.

Ramularia senecionis var. *carniolica* Jaap. — On *Senecio aronicioides.* — Although this species occurs at most of the localities on the mountain in which the host occurs it is most common at the bottom of the zig-zag on the Sisson Southern Trail. It has also been found in the small meadow between Gray Butte and Red Butte, at Wagon Camp, along the Wagon Camp Road, etc. Infected leaves dry up and disappear before the pycnidium-like knots of hyphae in the lesions have matured.
Collections: 8573, 8584, 10124-A, 10193, 18105, 20305, Exs. 32. Dates: 9, 16 July 1937; 17, 24 June, 8 July 1938; 28 June 1946; 18 July 1947. Abundance: III, C. Associates: Coniferous trees of all zones below the White Bark Pine zone. Distribution: Tyrol, Mt. Shasta.

Ramularia tulasnei Sacc. — On *Fragaria californica.* — Occasional at Wagon Camp, 5700 feet.
Collection: 20321, Exs. 282. Date: 8 July 1947. Abundance: IV, C. Associates: Both species of *Abies, Libocedrus decurrens, Ceanothus velutinus.* Distribution: Europe, North America; Mt. Shasta.

Sepedonium chrysospermum (Bull.) Fr. — Collected once on rotten Shasta fir wood at Horse Camp. Abundance: V, A. Associate: The host. Distribution: Siberia, Europe, North America; Mt. Shasta.

Sporotrichum sp. — Isolated from soil samples.

Titaea sp. — Collected once on overwintered herbage of *Arnica viscosa* above Horse Camp.

Trichoderma viride Lk. ex Fr. — On *Abies magnifica* var. *shastensis, Arctostaphylos patula, Quercus chrysolepis.* — On dead wood of these hosts and isolated from soil Shasta fir woods and the summit of Shastina.
Collections: 18371, 18372, 19310, 19419. Dates: 18 Aug. 1946; 7, 9 April

1947. Abundance: IV, A, B, D. Associates: Plants of Shasta fir and chaparral associations. Distribution: Cosmopolitan, Mt. Shasta.

Trichothecium roseum Lk. — Pink specimens turning yellow on drying and purple in KOH were collected on *Pinus albicaulis* wood, on Shasta fir bark, spread over soil and stones near bark, near Horse Camp, 8000 feet.
Collection: 18040. Date: 24 June 1946. Abundance: IV, A, D. Distribution: Asia, Hawaii, Europe, North America; Mt. Shasta.

Verticillium terrestre (Lk.) Lindau. — Isolated from soil samples.

Dematiaceae.

Brachysporium oosporum (Cke.) Sacc. — On *Sambucus racemosa* L. — Forming a black mat on dead canes, south side of Red Butte.
Collection: 25628. Date: 24 Aug. 1949. Abundance: V, B. Distribution: Europe, North America, Mt. Shasta.

Cercospora clavata Ger. — On *Asclepias cornuta.* — On leaves at Sisson, July 1894. Collected by W. C. Blasdale, distributed by Ellis and Everhart in North American Fungi No. 823, and Fungi Columbiani No. 792.

Chloridium sp. — Obtained from rotting wood of Shasta fir near Horse Camp.
Collections: 10077, 18077. Date: 27 June 1946. Abundance: V, A.

Cladosporium herbarum Pers. ex Fr. — Collected commonly on the overwintered herbage of most of the plants growing in the vicinity of Horse Camp. Also on *Melica californica* at Wagon Camp, on *Carex fracta* at MacBride Springs, and on *Elymus elymoides* on the north side of the mountain. On a slice of bread left at the 3-Mile post on the Summit Trail at about 13,000 feet. On rind of orange discarded near the 3-mile post along the Summit Trail at 13,000 feet. At this elevation whatever life exists must probably endure daily alternate freezing and thawing throughout the year. On pieces of cloth at Horse Camp and on a piece of cloth at the summit of the mountain. Material at Horse Camp grew on mildewed cloth kept in storage in a wet place for several years, 8000 feet. The piece of cloth at the summit, 14,161 feet was exposed to daily freezing and thawing throughout the year for about 8 years.
Collections: A number of collections and soil isolations in all years collections were made. Also 18,000-A ,18343, 18344, 18346. Dates: All years, 15 June, 6 Aug. 1946. Abundance: II, A, C, D. Associates: All materials over the mountain. Distribution: Cosmopolitan; Mt. Shasta.

Curvularia inaequalis (Shear) Boedijn. — Isolated from soil samples.

Dendryphium sp. — Collected once on overwintered herbage of *Poa pratensis* at Bear Springs.

Dendryphium pini v. Hoehn. — On bark of Shasta fir at Horse Camp.
Collections: 18078, 18079. Date: 27 June 1946. Abundance: V, A. Associate: The host. Distribution: Europe, Mt. Shasta.

Epochnium isthomorphum Sacc. — On *Chrysothamnus nauseosus* var. *occidentalis.* — Several branches of one shrub on the lava flow terminating at MacBride Springs were completely blackened, and apparently killed, by this species.
Collection: 13422. Date: 25 Aug. 1939. Abundance: V, B. Associates: *Purshia tridentata, Libocedrus decurrens, Pinus ponderosa.* Distribution: Washington, California; Mt. Shasta.

Helminthosporium vagans Drechsler. — On *Poa pratensis.* — Collected once on a number of leaves of clumps of the host near seepage from the fountain, around the Lodge, and in turf at the water system at Horse Camp, 8000 feet.
Collection: 8594, Exs. 30. Date: 28 July 1937. Abundance: V, C. Associate: *Juncus balticus* var. *montanus, Elymus elymoides.* Distribution: North America, Mt. Shasta.

Heterosporium allii Ell. & Martin. — On *Tritelia ixioides* var. *analina.* — Several leaves on a host colony below Wagon Camp were infected.
Collection: 15591. Date: 11 July 1941. Abundance: V, C. Associates: Both species of *Abies, Libocedrus decurrens.*

On *Allium validum.* — On overwintered herbage in Panther Creek Meadows.
Collection: 25621. Date: 24 Aug. 1949. Abundance: V, C. Associates: *Phyllodoce empetriformis, Kalmia polifolia.* Distribution: North America; Mt. Shasta.

Heterosporium asperatum Massee. — On *Smilacina stellata.* — Occuring with *Cylindrosporium smilacinae* on infected leaves of a large host colony at Wagon Camp.
Collection: 20315. Date: 18 July 1947. Associate: *Veratrum californicum, Libocedrus decurrens.* Abundance: V, C. Distribution: North America; Mt. Shasta.

Macrosporium puccinioides Ell. & Anderss. — On *Lathyrus lanzswertii* var. *aridus.* — Associated with *Uromyces fabae* on at least some leaves of a large diseased colony at MacBride Springs, 5000 feet.
Collection: 15611, Exs. 140. Date: 25 July 1941. Abundance: IV, C. Associates: *Purshia tridentata, Ceanothus velutinus, Arctostaphylos patula.* Distribution: Montana, Mt. Shasta.

Peyronelia sirodesmoides Cif. & Cav. — On *Holodiscus discolor* var. *glabrescens.* — On a dead branch lying on the ground on ridge above Horse Camp at about 9000 feet.

Collection: 18253. Date: 16 July 1946. Abundance: V, B. Associate: *Pinus albicaulis.* Distribution: Haiti, Mt. Shasta.

Polythrinciu m trifolii Kze. — See *Dothidella trifolii* (Pers. ex Fr.) Bayl.-Ell. & Stan.

Scolecotrichum graminis (Pers.) Fckl. — Occasional collections of grasses from most parts of the southwest slopes of the mountain between 4500 and 5500 feet included this species. The infected grasses include: *Bromus marginatus, Elymus glaucus, Glyceria elata, Melica aristata, Elymus hansenii* and *Stipa occidentaiis;* on *Elymus elymoides* at about 8000 feet on the north side of the mountain. Abundance: III, C. Distribution: On many grasses in Europe, North America; Mt. Shasta.

Stemphyllium consortiale (Thuem.) Groves & Skolko. — Obtained in cultures made from specimens of cloth on which *Cladosporium* was the only observed fruiting fungus. The isolations were made at the Biological Laboratories, Philadelphia Quartermaster Depot, by the late W. Lawrence White and his staff.

Stemphyllium sp. — Following the winter on in-tact fruit heads of *Monardella odoratissima* material assigned here formed a partial black mat. It was found only once at Horse Camp although it was looked for after each snow pack melted.

Torula ?crustacea? Schw. — Forming a black covering on the stems of a number of branches of *Salix scouleriana* near the Sisson Southern Trail spring.
Collection: 10158, Exs. 76. Date: 24 June 1938. Abundance: V, B. Associates: *Acer glabrum, Abies magnifica* var. *shastensis.* Distribution: North America; Mt. Shasta.

Stilbaceae.

Arthrobotryum spongiosum Hoerl. — Sterile material probably assignable to this species was found on young trees of *Libocedrus decurrens* at MacBride Springs.
Collection: 18268. Date: 19 July 1946. Abundance: IV, A. Associate: *Pinus ponderosa.* Distribution: California; Mt. Shasta.

Stilbum tomentosum var. *ovalisporum* A. L. Smith. — Collected several times on rotten Shasta fir wood in the vicinity of Horse Camp; and on mountain hemlock along Squaw Valley Creek.
Collections: 20205, 20270, 20276. Dates: Found in one year before 1941; 1, 10, 29 July 1947. Abundance: IV, A. Associates: The hosts. Distribution: Ceylon, Europe, Cuba, North America, Mt. Shasta.

Tuberculariaceae.

Arthrinium cuspidatum (Cke. & Harkn.) v. Hoehn. — Forming black spots on dead culms of *Juncus balticus* var. *montanus* and on dead leaves of *Carex* sp. at Horse Camp, 8000 feet.

Collection: 18032. Date: 24 June 1946. Abundance: IV, C. Distribution: Denmark, England, Western North America, Mt. Shasta.

Exosporium pedunculatum (Ell. & Ev.) W. B. Cke. — On *Sambucus glaucus.* — Pustules were produced from lenticels and cracks in bark on several branches on a shrub at MacBride Springs, 5000 feet.
Collection: 18295, Exs. 208. Date: 25 July 1948. Abundance: IV, B. Associates: *Arctostaphylos patula, Salix scouleriana.* Distribution: British Columbia, Washington, California, Mt. Shasta.

Cylindrocolla sp. — Collected on Shasta fir wood and boards at Horse Camp. This grows in the form of gelatinous orange hemispheres on the substratum. It was associated with *Guepiniopsis alpina* and may prove to be its imperfect or oidial stage.

Sphaeridium luteum v. Hoehn. — Collected once on rotten Shasta fir wood near Horse Camp.
Abundance: V, A. Associate: The host. Distribution: Austria, Mt. Shasta.

Sporobolomycetaceae.

Sporobolomyces roseus Kluyver & Van Neil. — Isolated as a result of attempting to culture spores of *Entyloma compositarum* on *Hieracium cynoglossoides* var. *nudicaule* by George Nyland in the spring of 1948.
Collection: 20230. Date: 10 July 1947. Distribution: Europe, North America, Mt. Shasta.

Mycelia Sterilia.

Rhizomorpha subcorticalis. — *Rhizomorpha subterranea.* — Found occasionally in association with roots and bark of newly fallen trees and on wood of trees blown over or fallen several years before being observed. In all zones below the White Bark Pine zone. See *Armillaria mellea.*

In addition several types of sterile mycelia and sclerotia have been found. White sterile mycelium was found parasittizing a small agaric; brown sterile hyphae were found forming a mat of White Bark Pine needles in litter under trees at Horse Camp. Pycnosclerotia heve been found associated with *Scolecotrichum graminis* infections on *Melica aristata,* and similar atrosclerotic masses of tissue have been found in connection with *Ramularia* infections on several hosts and with *Cylindrosporium smilacinae* on *Smilacina stellata.*

Using cultures derived from single ascospores from Mt. Shasta collections of *Clathrospora diplospora* (Ell. & Ev.) Wehm., *Clathrospora elynae* Rab. and *Leptosphaeria heterospora* (de Not.) Niessl., Simmons (23) obtained cultures assignable to the form species *Alternaria tenuis* Nees. Morphologically, then, this species is very variable including the imperfect state of many perfect fungi.

Leptoguignardia, eine neue Gattung der bitunicaten Ascomyceten.

Von Emil Müller.
(Aus dem Institut für spezielle Botanik der Eidg. Technischen Hochschule, Zürich.)

Mit 2 Textfig.

Im Juni 1954 bot mir Herr Prof. Dr. E. Gäumann die Gelegenheit, ihn bei einer Exkursion in die Westalpen zu begleiten. Ihm, sowie Herrn Prof. Dr. H. Pallmann, Präsident des Schweizerischen Schulrates, der mir einen Beitrag aus dem Albert-Barth-Fonds bewilligte, möchte ich für das grosse Entgegenkommen herzlich danken, ebenso Herrn K. H. Richle dipl. naturw. für seine flotte Reisekameradschaft.

Bei der Bearbeitung des gesammelten Materials fiel mir ein auf überwinterten Stengeln von *Onobrychis montana* D. C. wachsender Ascomycet auf, dessen Fruchtkörper mit denjenigen vieler Arten der Gattung *Guignardia* Viala et Ravaz übereinstimmten, dessen Ascosporen aber nicht ein-, sondern dreizellig waren. Zweifellos gehört der Pilz zu der durch von Arx und Müller (1954) umschriebenen Reihe der *Dothiorales,* wo er bei den *Botryosphaeriaceae* seinen natürlichen Anschluss findet. Hingegen gelang es mir nicht, ihn einer bekannten Gattung zuzuordnen; er stellt vielmehr den Typus einer neuen dar, welche nachfolgend beschrieben sei:

Leptoguignardia E. Müller nov. gen.

Perithecia sub epidermide nascentia, globosa vel depressa, ab initio fermata, demum poro irregulariter aperta; pariete perithecii e cellulis parenchymaticis, brunneis composito. Asci clavati, membrana crassa et duplica, in apice crassiore, brevissime stipitati, 8-spori. Sporae ellipsoideae vel crasso-fusoideae, hyalinae, pluriseptatae. Paraphysoides non frequentes, hyalinae, septatae.

Die kugeligen oder meist niedergedrückten Fruchtkörper sitzen unter der Epidermis und sind mit ihr fest verwachsen. Anfänglich völlig geschlossen, öffnen sie sich später durch Aufreissen und Wegbröckeln der flachen, seltener schwach vorragenden Scheitelpartie mit einem oft weiten unregelmässigen Porus. Die nicht besonders dicke, parenchymatisch aus wenigen Lagen von derbwandigen Zellen bestehende Gehäusewand ist dunkelbraun und in der Scheitelpartie meist etwas kleinzelliger als an der Basis. Die keuligen Asci besitzen eine derbe, am Scheitel verdickte, doppelte Membran und enthalten

acht Sporen. Diese sind ellipsoidisch, seltener breit spindelförmig, hyalin und durch Querteilung mehrzellig. Paraphysoiden sind nur spärlich vorhanden; sie sind meist zellig gegliedert und verschleimen leicht.

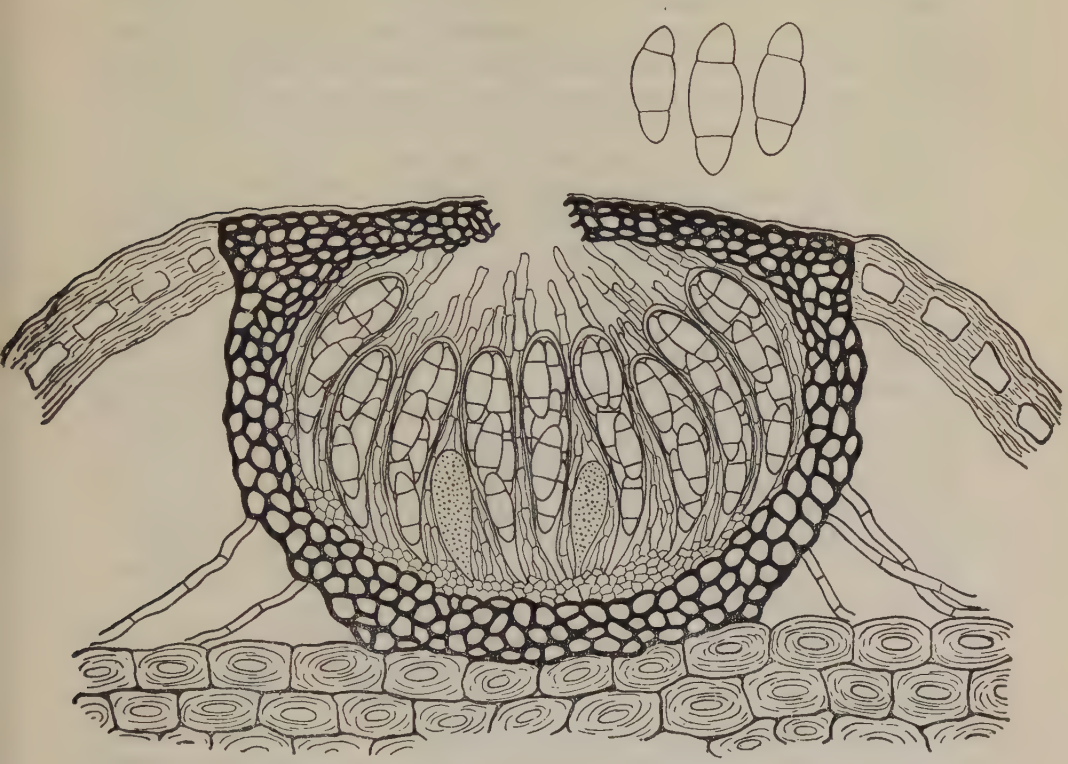

Abb. 1. *Leptoguignardia onobrychidis.* a) Medianschnitt durch einen Fruchtkörper der Hauptfruchtform, Vergr. 500 mal, b) Ascosporen, Vergr. 1000 mal.

Typus der Gattung und vorläufig einzige Art ist:

Leptoguignardia onobrychidis E. Müller nov. spec.

Perithecia dispersa, sub epidermide nascentia, globosa vel depressa, in apice saepe plana, 150—200 μ diam., primo fermata, demum poro irregulari aperta; pariete perithecii 15—20 μ crasso. e cellulis brunneis, angulato-rotundatis, in apice 4—6 μ diam., in latera et basi 6—10 μ diam. formato.

Status ascophorus: Asci clavati, 60—70 ⇌ 13—15 μ, 8-spori. Sporae, ellipsoideae, hyalinae, 14—22 ⇌ 5—6 μ, due-septatae, cellula media maxima. Paraphysoides hyalinae, septatae.

Status conidiophorus: Conidia sine conidiophoro nascentia, clavata, hyalina, 14—17 ⇌ 2,5—4 μ, medio septata, cellula prima crassior.

Hab. in caulibus emortuis *Onobrychidis montanae*. D. C. — Gallia, Val Queyras, Abriès, 12. 6. 1954; leg. E. Müller et K. H. Richle.

Die 150—200 μ grossen, dunklen, niedergedrückt kugeligen, oben meist deutlich abgeflachten Fruchtkörper wachsen zerstreut unter der Epidermis. Mit dieser sind sie fest verwachsen und besitzen seitlich einen mehr oder weniger deutlich ausgebildeten Ringwulst. Anfangs völlig geschlossen, öffnen sie sich später mit einem unregelmässigen Porus. Die 15—20 μ dicke Gehäusewand besteht aus einigen Lagen von polyedrischen, derbwandigen, besonders aussen dunkelbraun gefärbten Zellen, welche nach aussen höckerig vorstehen und gegen innen heller und zartwandiger werden. Im Scheitelbereich sind sie 4—6 μ, in den seitlichen und basalen Partien 6—10 μ gross und scheinen deshalb dort heller gefärbt.

Die ziemlich zahlreichen, der ganzen inneren Wand entlang stehenden, gegen das Zentrum zusammenneigenden Asci sind keulig, 60—70 ⇌ 13—15 μ gross, kurz knopfig gestielt und am Scheitel breit abgerundet. Sie besitzen eine derbe, doppelte Membran, welche im Scheitel deutlich verdickt ist, enthalten acht Sporen und sind von spärlichen, zellig-faserigen, zum Teil verschleimenden, hyalinen Paraphysoiden umgeben. Die Sporen sind ellipsoidisch oder breit spindelförmig, beidends verjüngt und abgerundet, oft etwas ungleichseitig, 14—22 ⇌ 5—6 μ gross, hyalin und sie besitzen zwei Querwände, durch die sie in zwei kleine Endzellen und eine mittlere, längere und breitere Zelle geteilt sind.

In Gehäusen, die in ihrem Bau mit den Perithecien der Hauptfruchtform übereinstimmen, bilden sich der ganzen inneren Wand entlang, ohne Konidienträger keulige, hyaline, 14—17 ⇌ 2,5—4 μ grosse Konidien. Diese sind in der Mitte septiert; die untere (also wandnahe) Zelle ist deutlich breiter als die obere. Diese Nebenfruchtform gehört in die Formgattung *Diplodina* West.

Es war mir daran gelegen, Typen anderer phragmosporer Gattungen zu untersuchen, um einmal die Neuheit der Gattung zu überprüfen und sie auch gegenüber ihren Verwandten abzugrenzen.

Leptodothiora von Höhnel [Typus: *Leptodothiora elliptica* (Fuck.) v. Höhn.] habe ich schon früher untersucht. Auf dem in Genf aufbewahrten Teil der Originalkollektion von *Dothiora elliptica* Fuck. findet sich leider nur *Pseudophacidium ledi* (Alb. et Schw.) Karsten. Erst auf dem mir vom Reichsmuseum in Stockholm zur Verfügung gestellten Material fand ich neben *Pseudophacidium ledi* auch noch die *Leptodothiora*. Diese ist gleich gebaut wie *Dothiora* Fr. (Abbildung z. B. bei Müller und von Arx, 1950), unterscheidet sich aber durch die Sporen, welche konstant nur Quersepten aufweisen. Sie hat jedenfalls grössere, knollige oder kissenförmige, sehr dickwandige Gehäuse; die meist zylindrischen Asci stehen ohne Paraphysoiden

dicht parallel nebeneinander und sie öffnen sich durch Wegbröckeln grösserer Deckschichtpartien.

Phragmosperma Theiss. et Syd. [Typus: *Phragmosperma marattiae* (P. Henn.) Th. et Syd.] konnte ich ebenfalls dank dem freundlichen Entgegenkommen der Leitung des Reichsmuseums in Stockholm untersuchen. Der Typus dieser Gattung ist ähnlich gebaut wie die Gattung *Sphaerulina* Sacc. [Typus: *Sphaerulina myriadeae* (D. C.) Sacc.] und gehört dementsprechend zu den *Mycosphaerellaceae.*

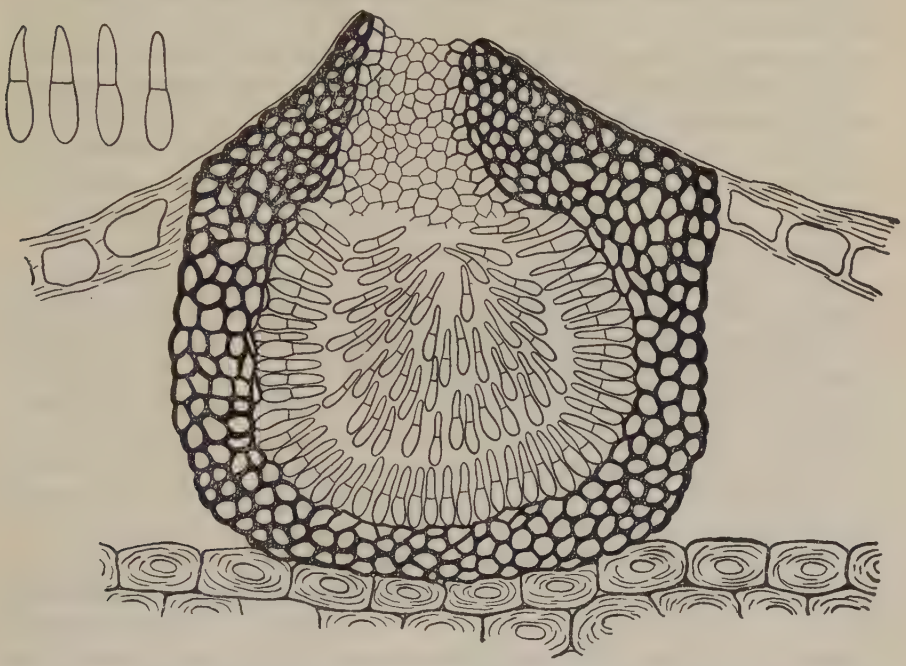

Abb. 2. *Leptoguignardia onobrychidis.* a) Schnitt durch einen Fruchtkörper der Pyknidienform. Vergr. 500 mal. b) Konidien, Vergr. 1000 mal.

Metasphaeria Sacc. ist ausserordentlich schwierig zu beurteilen. In meiner Arbeit über die schweizerischen Arten der Gattung *Leptosphaeria* Ces. et de Not. (Müller, 1950) war ich bei der Einordnung der Gattung Petrak (1923) gefolgt. Darnach sollen die *Metasphaeria*-arten in ihrem Bau mit den Arten der Gattung *Leptosphaeria* übereinstimmen und sich nur durch hyaline Sporen unterscheiden. Ich habe damals die von mir bearbeiteten *Metasphaeria*arten mit *Leptosphaeria* vereinigt, darauf hingewiesen, dass sie in vielen Fällen zu bestimmten *Leptosphaeria*formenkreisen gehören und dass sich deshalb die beiden Gattungen nicht nebeneinander aufrechterhalten liessen. Leider besteht kein allgemein anerkannter Typus der Gattung *Metasphaeria.* Die von Clements und Shear (1931) vorgeschla-

gene *Metasphaeria sepincola* (B. et Br.) Sacc. zeigt einen eigenartigen Bau und unterscheidet sich in mehrfacher Beziehung von *Leptoguignardia* (vgl. Müller, 1950, p. 284). Die von Saccardo (1883) an erster Stelle erwähnte *Metasphaeria boehmeriae* (Rbh.) Sacc. habe ich ebenfalls untersucht, darauf aber nur einen Pyknidienpilz mit stark verschrumpften, wahrscheinlich einzelligen, durch Plasmateilung aber mehrzellig erscheinenden, hyalinen, kleinen, ellipsoidischen Sporen gefunden. Auch mit andern mir bekannten bisher als *Metasphaeria* beschriebenen Pilzen, hat *Leptoguignardia* nichts gemeinsam..

In seine neue Gattung *Trichometasphaeria* stellte Munk (1953) mehrere als *Metasphaeria* beschriebene Arten. Diese Gattung soll sich unter anderem durch einen mehr oder weniger deutlich ausgebildeten Klypeus, sowie durch die mit Schleimhüllen versehenen Sporen auszeichnen. Auch diese Gattung ist mit *Leptosphaeria* nahe verwandt und ihre Existenzberechtigung wäre noch an Hand der Typusart zu überprüfen.

Sphaerialea, eine neue von de Camaro (1926) beschriebene Gattung soll Pilze mit hyalinen, konstant dreizelligen Sporen umfassen. Abgesehen davon, dass eine solche Gattung an und für sich fragwürdig ist, hat der Autor als erste Art *Sphaerella primulaecola* Winter angeführt, welche nicht hyaline, sondern reif gelbliche Sporen besitzt und zur Gattung *Leptosphaeria* Sektion *Scleropleella* gehört. Streng genommen muss diese Art als Typus der Gattung gelten, weshalb *Sphaerialea* de Camara als unnötiges Synonym von *Leptosphaeria* zu betrachten ist.

Alle bisher in die Familie der *Botryosphaeriaceae* sensu von Arx und Müller (1954) gestellten Gattungen besitzen einzellige Sporen. Die *Montagnellina* v. Höhn. nahe stehende Gattung *Achorodothis* Syd. [Typus: *Achorodothis poasensis* Syd.] hat Sporen mit einem zelligen, hyalinen Anhängsel am unteren Ende, während die ebenfalls zur Familie zu stellenden Gattungen *Otthiella* Sacc. und *Otthia* Fuck. zweizellige Sporen besitzen und ganz anders gebaute Fruchtkörper aufweisen.

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Notes on some Indian Cercosporae - VI.*)

By H. C. Govindu and M. J. Thirumalachar (Bangalore, India).

With Plates I—IV.

This is a continuation of the previous studies on the Cercosporae of India based on collections made in different places. Accounts of the species some of which are either new records for India or new to Science are presented in this paper. Type material of the new species are deposited in the Herb. Crypt. Ind. Orient. New Delhi, Herb. C.M.I., Kew England, Mycological Division, U.S.D.A., Beltsville, Maryland, U.S.A. and in the Mycological Herbarium, Cornell University, Ithaca, N.Y., U.S.A.

Cercospora erythroxylonis sp. nov.

Leaf spots circular to irregular, 2 to 4 mm. in diameter, reddish-brown in the centre and surrounded by light brown border. Fruiting mostly hypophyllous. Stroma of few brown cells, 15—40 μ in diameter. Conidiophores medium brown to pale olivaceous, unbranched and unseptate, straight or undulate, blunt at apex, 26—30 ⇌ 2.8—4.2 μ. Conidia subhyaline to pale olivaceous, obclavate to cylindric, obconical at base, blunt at apex, 1—5-septate, 8—30 ⇌ 2.8—5.7 μ.

On leaves of *Erythroxylon monogynum,* Nandi Hills, Mysore, 26-2-1953, leg. H. C. Govindu (Fig. 1).

Maculae circulares vel irregulares, 2—4 mm. in diam. in centro rubro-brunneae, pallide brunneo-marginatae. Caespituli plerumque hypophylli. Hypostroma e paucis cellulis compositum, 15—40 μ in diam. Conidiophora brunneola vel pallide olivacea, continua, simplicia, recta vel undulata, antice obtusa, 26—30 ⇌ 2.8—4.2 μ. Conidia subhyalina vel pallide olivacea, obclavata vel cylindrica, postice obconica, antice obtusa, 1—5-septata, 8—30 ⇌ 2.8—5.7 μ. There is no previous record of *Cercospora* species on this host family *Erythroxylaceae. C. lini* Ell. & Evr. is known on the closely related family *Linaceae.*

Cercospora trichodesmae sp. nov.

Infection spots circular to irregular, 5 to 7.5 mm. in diameter, greyish-brown, and greyish-white at the centre. Fruiting mostly hypophyllous. Stroma of few brown cells, 15—45 μ in diameter. Conidiophores pale brown to olivaceous, rarely branching, 1—5-septate, straight or undulate, 14—80 ⇌ 2.8—4.2 μ. Conidia subhyaline, straight or curved, narrowly obclavate obconically truncate at base, acute at tip, 1—12-septate, 21—85 ⇌ 4.2—5.7 μ.

*) Parts IV and V in Sydowia 1954, p. 221—230, 343—348.

On the leaves of *Trichodesma zeylanica,* Savandurga, Mysore, 8-3-1953, leg. H. C. Govindu (Fig. 2).

Maculae circulares vel irregulares, 5—7.5 mm. in diam. griseo-brunneae, centro griseo-albae. Caespituli plerumque hypophylli. Hypostroma e paucis cellulis compositum, 15—45 μ in diam. Conidiophora pallide brunnea vel olivacea, vix ramosa, 1—5-septata, recta vel undulata, 14—80 ⇌ 2.8—4.2 μ. Conidia subhyalina, recta vel curvata, angustissime obclavata, postice obconica, apice acuta, 1—12-septata, 21—85 ⇌ 4.2—5.7 μ.

Several Cercosporae are known on the members of the *Boraginaceae*, but no species has previously been recorded on *Trichodesma. C. trichodesmae* differs from other species including *C. myxae* Syd. recorded from India.

Cercospora lepidagathidis sp. nov.

Infection spots circular to subcircular, distinct, 4—7 mm. in diameter, with greyish-white centre and surrounded by a pinkish or brown border. Fruiting amphigenous, stroma none or composed of few brown cells. Fascicles dense; conidiophores brown to pale olivaceous, rarely branched, 1—6-septate, strongly geniculate, hyaline at the tip, bulbous at the base, 33—183 ⇌ 2.8—5.7 μ. Conidia hyaline, obclavate to cylindric, obconical at base, subacute at tip, 1—14-septate, 23—170 ⇌ 2.8—4.2 μ.

On the leaves of *Lepidagathis cuspidata,* Sitalayyanagiri. Bababudans, Mysore, 20-5-1953, leg. H. C. Govindu (Fig. 3).

Maculae circulares vel subcirculares, 4—7 mm. in diam. in centro griseo-albae, roseo-vel brunneo-marginatae. Caspituli amphigeni. Conidiophora dense stipata, brunnea vel pallide olivacea, vix ramosa, 1—6-septata, forte geniculata, antice hyalina, postice bulbosa, 33—183 ⇌ 2.8—5.7 μ. Conidia hyalina, obclavata vel clavata, postice obconica, antice subacuta, 1—14-septata, 23—170 ⇌ 2.8—4.2 μ.

No species of *Cercospora* has been recorded on the host genus *Lepidagathis. C. acanthi* Pass. and *C. barlericola* Payak & Thirumalachar resemble to some extent *C. lepidagathidis,* but the conidial measurements and presence of stroma distinguish the species.

(4) *Cercospora* species.

Leaf spots distinct, angular to irregular 0.5 to 1 cm. in diameter dark brown to greyish-white, surrounded by a black border. Fruiting amphigenous, stroma of compactly grouped cells, medium-brown, often protruding above the epidermis, 30—80 μ in diameter. Conidiophores pale olivaceous to medium brown, unbranched, unseptate, short and stumpy, 7—21 ⇌ 2.8—4.2 μ. Conidia subhyaline, straight or curved, 1—12-septate, obclavate to cylindric, obconically truncate at base, actute at tip. 30—120 ⇌ 2.8—4.2 μ.

On leaves of *Compositae* (*Vernonia* sp.?), Bababudangiri, Mysore, 20-5-1953, leg. H. C. Govindu (Fig. 4).

(5) *Cercospora oculata* Ellis & Kellermann **indica** var. nov. *C. oculata* Ellis & Kellermann Bull. Torrey Bot. Cl. **11**: 116, 1884.

Infection spots on leaves circular to polygonal, definite, 4—8 mm. in diameter, greyish to reddish brown, greyish-white at the centre, surrounded by raised margin, often coalescing to form larger patches. Fruiting body chiefly amphigenous. Stroma well developed, consisting of compactly grouped brown cells, 35—50 μ in diameter. Conidiophores arising in dense fascicles, medium-brown to light olivaceous-brown, indistinctly 1—5-septate, once geniculate at the tip which appear as bifurcations, 14—57 ⇌ 2.1—3.5 μ. Conidia subhyaline, narrowly obclavate to acicular, 1—12-septate, straight or curved, base obconically truncate tip acute, 28.5—85.5 ⇌ 2.1—3 μ.

On leaves of *Veronia bourneana*, Sitalayanagiri, Bababudans, Mysore, 20-5-1953, leg. H. C. Govindu (Fig. 5).

The fungus closely resembles *C. oculata* Ellis & Kellm. known so far only U.S.A. on *Veronia baldwinii*. The slight differences in the width of conidia, bifurcations of the apices of conidiophores in the species under study is taken as basis for separating the new variety.

6. **Cercospora knoxiae** sp. nov.

Infection spots on leaves subcircular to polygonal, 5—8 mm. in diameter, olivaceous brown in the centre, surrouded by reddish-brown zone, with pinkish border. Stroma well developed, compact, composed of dark-brown cells, 30—70 μ in diameter. Conidiophores in dense fascicles, medium brown to pale olivaceous, 1—8-septate, irregular in width, rarely branching, attenuated and hyaline at the apex, 21—71 ⇌ 2.4—4.2 μ. Conidia subhyaline, straight or flexuous, obclavate to cylindric, obconical at base and acute at tip, 1—8-septate, 28—64 ⇌ 2.8—4.2 μ.

On the leaves of *Knoxia corymbosa*, Doddabetta, Nilgiris, 20-6-1953, leg. H. C. Govindu (Fig. 6).

Maculae subcirculares vel angulosae, 5—8 mm. in diam., in centro olivaceo-brunneae, zonula roseo-brunnea cincta. Hypostroma bene evolutum, compactum, e cellulis brunneis compositum, 30—70 μ in diam. Conidiophora dense stipata, brunneola vel pallide olivacea, 1—8-septata, vix ramosa, antice hyalina et attenuata, 21—71 ⇌ 2.4—4.2 μ. Conidia subhyalina, recta vel flexuosa, obclavata vel cylindrica, postice obconica, antice acuta, 1—8-septata, 28—64 ⇌ 2.8—4.2 μ.

(7) *Cercospora venezuelae* Chupp. var. **indica** var. nov.

C. venezuelae Chupp. in Monog. Univ. Puerto Rico Ser. B. **2**: 254, 1934.

Infection spots on leaves circular to irregular 5 to 10 mm. in diameter, pale brown to olivaceous brown, surrounded by a dark

brown margin. Fruiting amphigenous, but chiefly epiphyllous, stroma of dark brown cells. 30 to 80 μ in diameter. Conidiophores in dense fascicles, pale olivaceous to subhyaline, unbranched, somewhat undulate, 1—6-septate, not geniculate, tip conical or rounded, 15—64 ⇌2.8—4.2 μ. Conidia subhyaline, straight or slightly flexuous, obclavate to cylindric, 1—12-septate, base obconically truncate and apex rounded, 21—71 ⇌ 2.8—5 μ.

On leaves of *Solanum indicum,* Hosamande, Nilgiris, 19-6-1953, leg. H. C. Govindu (Fig. 7).

C. venezuelae was described by Chupp from Venezuela on *Solanum argenteum* and is so far known only from South America. There are several species of *Cercospora* known on *Solanum* species, but the one under study in placed near *C. venezuelae* on account of close spore measurements and narrow conidiophores. However, to indicate the few characteristic differences such as septate conidiophores, broader stroma etc. the new variety *indica* is allocated.

8. **Cercospora nilghirensis** sp. nov.

Infection spots circular to polygonal, yellowish brown with whitish centre, often coalescing with each other. Fruiting mostly amphigenous. Stroma absent, composed of few brown cells. Conidiophores medium brown to pale olivaceous, densely fasciculate, unbranched, 1—10-septate, strongly geniculate, attenuated and hyaline at the tip, 70—300 ⇌ 3.7—5 μ. Conidia hyaline, obclavate to acicular, straight or flexuous, obconically truncate to acicular, truncate at base, acute at apex, 1—28-septate, 50—200 ⇌ 3.7—5.5 μ.

On leaves of *Conyza ambigua,* Hosamande Niligiris, Madras, 18-6-1953, leg. H. C. Govindu (Fig. 8).

Maculae circulares vel angulosae, atro-brunneae, in centro albae, saepe confluentes. Caespituli amphigeni. Hypostroma nullum vel e cellulis paucis compositum. Conidiophora brunneola vel pallide olivacea, dense stipata, simplicia, 1—10-septata, plus minusve undulata, antice hyalina et attenuata, 70—300 ⇌ 3.7—5 μ. Conidia hyalina, obclavato-acicularia, recta vel curvula, postice truncata sursum attenuata et acuminata, 1—28-septata, 50—200 ⇌ 3.7—5.5 μ.

The conspicuously long conidia and conidiophores of the fungus under study distinguished it as a separate species. *C. blumeae* de Thum. on *Conyza viscosula (Blumea viscosula)* has effuse growth with non-fasciculate conidia, and *C. conyzae* described by Sawada from Japan is nomen dubium, since according to Dr. Chupp authentic material (Monogr. *Cercospora* p. 131, 1953) showed only a species of *Septoria.*

(9) *Cercospora eupatoricola* Govindu and Thirumalachar. Sydowia VIII. p. 225 (1954).

On leaves of *Eupatorium glandulosum,* Hosamande, Nigiris, Madras, 18-6-1953, leg. H. C. Govindu (Fig. 9).

The same species was previously reported on *Eupatorium rheevesi* on the basis of collection made in Sibpur, Calcutta.

(10) *Cercospora rubi* Sacc. Nuov. Giorn. Bot. Ital. **8**: 188, 1876.

On leaves of *Rubus racemosus,* Ootacamund, 18-6-1953, leg. H. C. Govindu. Previously the same species had been recorded on *R. vulgaris* from Kemmangundi, Mysore, by Thirumalachar and Chupp (Mycologia **40**: 360, 1948) (Fig. 10).

(11) *Cercospora krugiana* Müller & Chupp. Arch. Inst. Biol. Veget. R. de Janeiro, **3**: 94, 1936.

Infection spots on leaves circular to irregular, 2 to 5 mm. in diameter, often coalescing with each other forming large patch, slightly raised, dark brown to tan, with greyish-white at the centre. Fruiting mostly amphigenous. Stromata absent or consists of few cells.

Conidiophores dark-olivaceous brown to medium brown, slightly swollen at the base, usually streight, unbranched, 1—8-septate, 1—2-geniculate and hyaline at the tip, 50—250 ⇌ 2.5—5.5 μ. Conidia hyaline, acicular, straight or slightly flexuous, 1—16-septate, 20—150 ⇌ 2—4.2 μ, truncate at base and acute at tip.

On leaves of *Boehmeria nivea* Gaud., Department of Agriculture Compound, Bangalore, 15-8-1953, eg. H. C. Govindu (Fig. 11).

C. krugiana was reported by Müller and Chupp from Brazil on the same host species and has so far not been known outside the type locality. The general characters in the collections studied by us is identical with the descriptions given by Müller and Chupp.

(12) *Cercospora waltheriae* Thirumalachar & Chupp. Mycologia **40**: 361—362, 1948.

On leaves of *Walteria indica* L., Nandi village, Mysore, 10-9-1952, leg. H. C. Govindu (Fig. 12).

(13) *Cercospora carthami* (H. & P. Sydow) Sunderaraman & Ramakri. Agr. Jour. India, **23**: 383, 1928.

On leaves of *Carthamus tinctorius* Linn., Hebbal, 4-10-1953, leg. H. C. Govindu (Fig. 13).

(14) *Cercospora medicaginis* Ell. & Evr. Proc. Acad. Nat. Sci. Phila. Part I, **43**: 91, 1891.

Leaf spots circular to irregular, 2—5 mm. in diameter, appearing as sooty patches, dark brown to almost black in the centre, with a definite yellowish-green border. Fruiting amphigenous. Stroma composed of few brown cells. Conidiophores pale brown to medium brown, hyaline at the apex, unbranched, 1—6-septate, geniculate at the tip, 24—85 ⇌ 4.2—5.7 μ. Conidia hyaline, obclavate to acicular, broad and truncate at the base, tip subacute, 1—16-septate, 28.5—115 ⇌ 2.8—4.2 μ.

On leaves of *Medicago sativa* Linn., Hebbal, Bangalore, 27-10-1953, leg. H. C. Govindu (Fig. 14).

(15) *Cercospora corchori* K. Sawada. Agri. Exp. Sta. Formosa I. (Spezial Bull), **37**: 667, 1919.

On leaves of *Corchorus tridens,* Hebbal, Bangalore, 28-10-1953, leg. H. C. Govindu (Fig. 15).

(16) **Cercospora blainvilleae** sp. nov.

Infection spots on leaves angular to polygonal, 2—5 mm. in diameter, dark-brown, often coalescing with each other to form large patches. Fruiting amphigenous. Stroma absent, or consists of few brown cells. Conidiophores divergent, unbranched, 1—3-septate, medium olivaceous-brown subhyaline at the tip, 1—2-geniculate at the tip, 14—57 ⇌ 2.8—5.5 μ. Conidia hyaline, acicular, straight or curved, 1—20-septate, conical or truncate at base, acute at tip, 33—166 ⇌ 2.8—5.5 μ.

On leaves of *Blainvillea latifolia,* Hebbal, Bangalore 15-11-1953, leg. H. C. Govindu (Fig. 16).

Maculae angulares plus minusve irregulares, 2—5 mm. in diam., atro-brunneae, saepe confluentes. Caespituli amphigeni. Hypostroma nullum vel e paucis cellulis compositum. Conidiophora divergentia, simplicia, 1—3-septata, olivaceo-brunneola, antice subhyalina, apicem versus undulata, 14—57 ⇌ 2.8—5.5 μ. Conidia hyalina, acicularia, recta vel curvula, 1—20-septata, postice obconica et truncata, antice acuta, 33—166 ⇌ 2.8—5.5 μ.

(17) *Cercospora cheiranthi* Sacc. **brassicae** var. nov. *C. cheiranthi* Sacc. in Nuovo Gior. Bot. Ital **8**: 187 1876.

Infection spots on siliqua indefinite, forming greyish-white patches. Condiophores fasciculate, arising from stroma, 10—30 μ in diameter, yellowish-brown, thick and stumpy, unbranched, 1—3-septate, 1—2-geniculate at the tip, 14—42.5 ⇌ 4.2—5.7 μ. Conidia hyaline, clavate, 1—6 septate, 14—38 ⇌ 2.8—3.5 μ, truncate at base, and rounded at the apex.

On the siliqua of *Brassica nigra,* Hebbal, Bangalore, 15-12-1953, leg. H. C. Gonvindu (Fig. 17).

The fungus has been observed only on the maturing pods and often gets associated with *Alternaria brassicae.* The fruiting bodies of the *Cercospora* are however quite distinct. In the absence of any collection made on the leaves, the species is referred to as a variety of *Cercospora cheiranthi* Sacc. known only on *Cheiranthus cheiris.* This species has some resemblance with the fungus studied by us on *Brassica nigra* in having short stumpy conidiophores of somewhat similar measurements. The conidia are however, longer in *C. cheiranthi* (20—100 μ as compared with 13—38 μ in the species under study), and is therefore referred to tentatively to a new variety.

(18) *Cercospora uramensis* Chupp & Müller. Bol. Soc. Venez. Cien. Nat. **8**: 58, 1942.

Infection spots on leaves not observed. On maturing capsules spots none, fruiting bodies abundant forming effuse growth, greyish-white at first, turning greyish-black later on. Stroma consisting of few brown cells 1—25 μ in diameter. Conidiophores medium to olivaceous brown, paler and hyaline at the tip, unbranched, 1—12-septate, abruptly geniculate at the tip, 70—233 ⇌ 2.8—3.5 μ. Conidia hyaline, acicular, straight or flexous, 1—30-septate, truncate at base, acute at tip, 50—266 ⇌ 2—3.5 μ.

On fruits of *Cleome monophylla,* Hebbal, Bangalore, 15-10-1953, leg. H. C. Govindu (Fig. 18).

As in the previous case, infection has not been observed on leaves but only on the maturing capsules. The characteristic fruiting bodies with long unbranched conidiophores and conidia measuring more than 200 μ clearly indicates that fungus is *C. uramensis* also described on species of *Cleome.* Previously *C. cleomes* has been reported on the same host from India.

(19) *Cercospora caracasensis* Chupp & Muller. Bol. Soc. Venez. Cien. Nat. **8**: 39, 1942.

Leaf spots circular to irregular, 2—8 mm. in diameter, often coalescing to form large patches, greyish- white at the centre and dark brown along the margin. Fruiting amphigenous. Stroma well developed, globular, compactly grouped, composed of dark brown cells, 15—60 μ in diameter. Conidiophores medium, olivaceous brown, unbranched, unseptate and non-geniculate, 7.2—21 ⇌ 2—3 μ. Conidia subhyaline to pale olivaceous, straight or slightly curved, obclavate, obconical at base, acute at tip, 16—50 ⇌ 2.5—3 μ.

On leaves of *Anona squamosa* L., Hebbal, Bangalore, 1-12-1953, leg. H. C. Govindu (Fig. 19).

The identical spore measurements and structure of the stroma, conidiophores etc. indicate that the fungus under study is *C. caracasensis* known so far only from the type locality in Venezuela, South America. The very short conidiophores up to 21 μ developing from stroma and being unbranched, unseptate and nongeniculate distinguishes it from other species recorded on the host genus *Anona. Cercospora anonae* Müller & Chupp. was previously recorded by Mundkur and Ahmad (Mic. paper C.M.I., England, 18, llp. 1946) an *A. squamosa* from Bihar.

(20) **Cercospora oldenlandicola** sp. nov.

Leaf spots circular to irregular, 2—6 mm. in diameter, dark brown to black, often coalescing with each other involving infection of the entire leaf. Fruiting amphigenous. Stroma subepidermal, composed of brown cells, 10—25 μ in diameter. Conidiophores dark-brown, tip hyaline, short, bulbous at base, tapering at the apex, sterigma-like, unbranched, unseptate, 10—20 μ long, 2.8—4.2 μ at top, 3—7 μ at base.

Conidia subhyaline, acicular, straight or curved, 1—16-septate, 21—78.5 ⇌ 2—3 μ.

On leaves of *Oldenlandia* sp., Hebbal, Bangalore, 30-11-1953, leg. H. C. Govindu (Fig. 20).

Maculae circulares vel irregulares, 2—6 mm. in diam., atro-brunneae vel nigrae, raro confluentes Caespituli amphigeni. Hypostroma subepidermale, atro-brunneum, compactum, 10—25 μ in diam. Conidiophora atro-brunnea, antice hyalina, brevia postice bulbosa, antice attenuata „sterigmatibus" similia, simplicia, continua, 10—20 μ longa, antice 2.8—4.2 μ, postice 3—7 μ crassa. Conidia subhyalina, acicularia, recta vel curvata, 1—16-septate, 21—78.5 ⇌ 2—3 μ.

The type of conidiophores being bulbous at base, and tapering like sterigmata, clearly distinguihes the species under study from *Cerc. oldenlandiae* Hansford, described on *Oldenlandia* sp. and *Borreria sinensis* from Uganda. The latter species has long septate conidiophores up to 100 μ long.

(21) *Cercosporia subsessilis.* H. & P. Syd. Ann. Mycol. **11**: 329, 1913.

Leaf spots circular to polygonal, 2—6 mm. in diameter, dark-brown to tan, sometimes with pink margin. Fruiting amphigenous, stroma well developed, composed of compactly grouped brown cells 20—50 μ in diameter. Conidiophores medium brown to yellowish-brown, mostly unbranched, unseptate, tubular, blunt and short, 14—35 ⇌ 2.8—4.2 μ. Conidia subhyaline to pale olivaceous, narrowly cylindric, 1—6-septate, obconically truncate at base, acute at tip, 14—57 ⇌ 2.8—4.2 μ.

On leaves of *Switenia mahogoni* Jacq., Sibpur, Calcutta, 9-1-1952, leg. H. C. Govindu (Fig. 21).

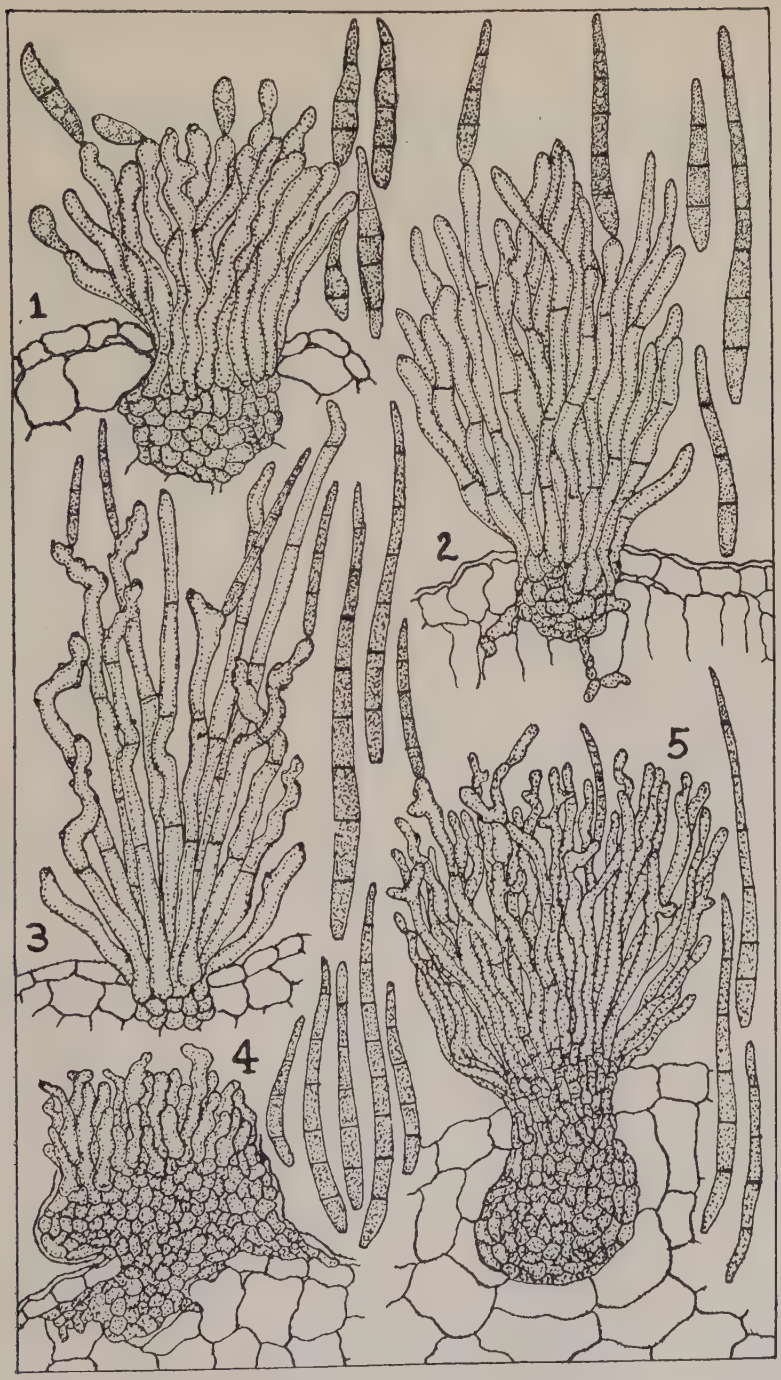
On the basis of the occurrence of identical morphological characters and spore measurements, Dr. Chupp identified the *Cercospora* sp. on *Switenia mahogoni* from Brazil as *C. subsessilis* first reported from India on *Melia azedarach* (Monogr. Cercospora 386 p. 1953). Study of the collections made by us on *S. mahogoni* has also characters identical with *C. subsessilis.*

In conclusion the writers wish to acknowledge their indebtedness to Dr. F. Petrak, Wien, Austria for kindly translating the descriptions of the news species into latin.

Explanation of Plate III—VI.

Magnification about 750.

Fig. 1. *Cercospora erythroxylonis.* — 2. *C. trichodesmae.* — 3. *C. lepidagathidis.* — 4. *C. sp.* on *Compositae.* — 5. *C. oculata* var. *indica.* — 6. *C. knoxiae.* — 7. *C. venezuelae* var. *indica.* — 8. *C. nilghirense.* — 9. *C. eupatoricola.* — 10. *C. rubi.* — 11. *C. krugiana.* — 12. *C. waltheriae.* — 13. *C. carthami.* — 14. *C. medicaginis.* — 15. *C. corchori.* — 16. *C. blainvilleae.* — 17. *C. cheiranthi* var. *brassicae.* — 18. *C. uramensis.* — 19. *C. caracasensis.* — 20. *C. oldenlandicola.* — 21. *C. subsessilis.*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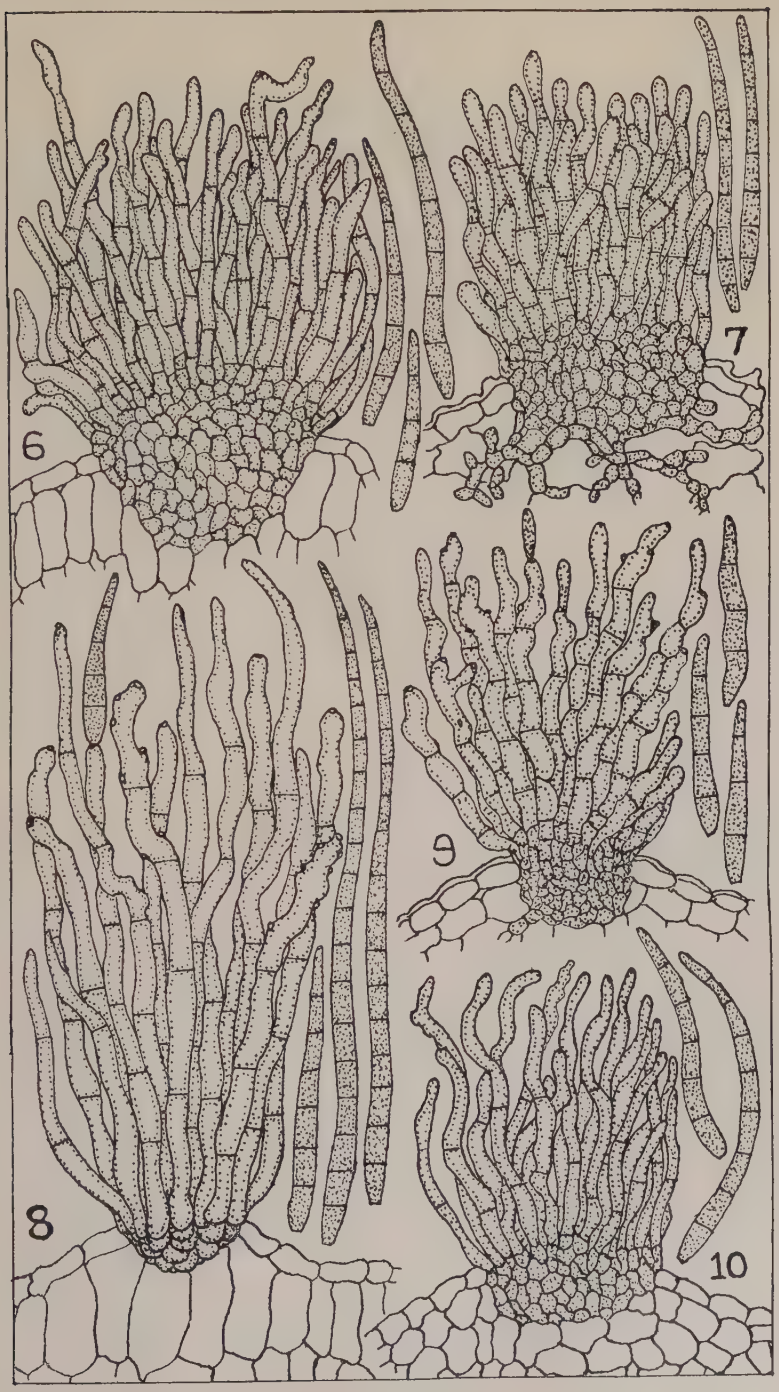
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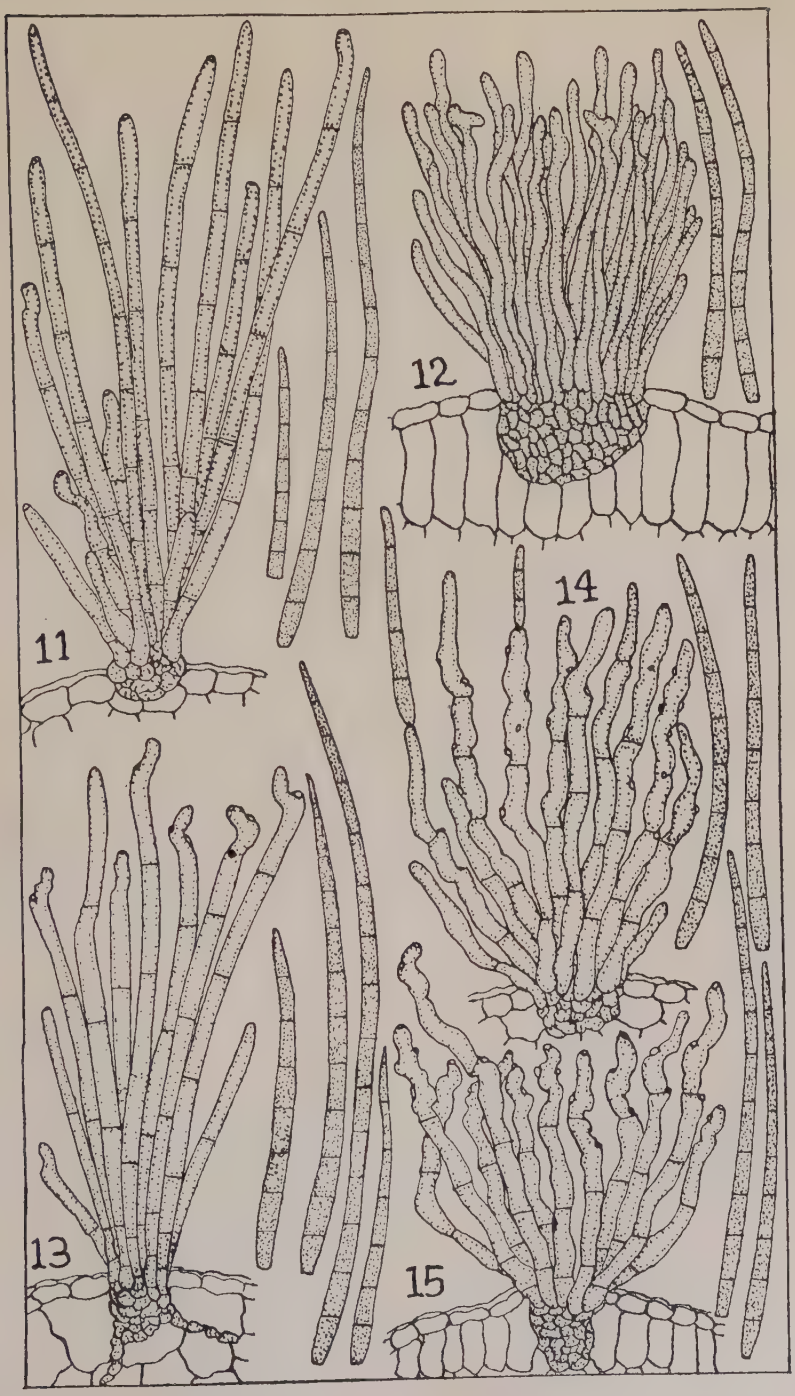
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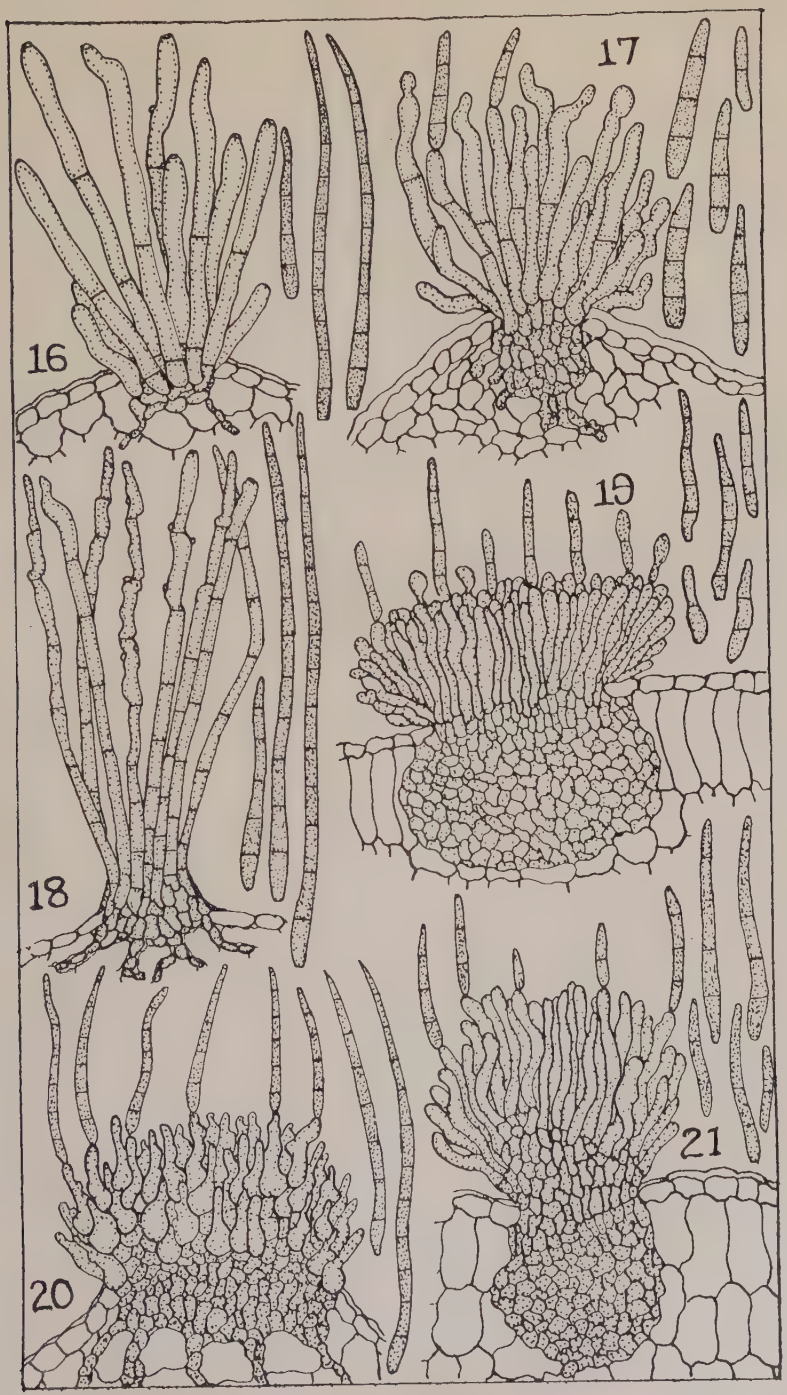
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Sur Didymella phacae nov. spec.

Par Roger Corbaz.
(Institut de botanique spéciale, Ecole Polytechnique Fédérale, Zürich.)
Avec 1 figure.

Au cours de mes recherches sur le genre Didymella Sacc., j'ai trouvé une espèce nouvelle dont la diagnose est la suivante:

Didymella phacae Corbaz nov. spec.

Pseudotheciis sparsis, epiderme immutata vel sublevata tectis, globoso-depressis, 250—300 μ, atris, ostiolo papillato vel conoideo erumpente praeditis; ascis cylindraceo clavatis, breviter pedicellatis, apice rotundatis, bitunicatis, 48—55 × 9—12 μ; sporidis distichis, hyalinis, irregulariter septatis, ad septum parum constrictis, cellula anteriore brevi crassaque, posteriore longa tenuique, 11—12 × 4—5 μ.

In caulibus emortuis *Phacae alpinae* L. ad pagem Gabi, Feerberg, Helvetia; 10. 6. 1953, leg. E. Müller.

Les pseudothèces sont dispersés, leur croissance est subépidermale. Ils sont piriformes et fortement aplatis à la base, allongés dans l'axe de la tige qui leur sert de support. Brun-foncé, ils mesurent 250—300 μ. L'ouverture est papillaire, érompante à maturité. La paroi, épaisse de 25 μ environ, est formée de cellules polyédriques brunes, de 10—12 μ. Les asques sont cylindriques ou claviformes, sessiles ou légèrement pédicellés, à double paroi, mesurant 48—55 × 9—12μ; ils contiennent 8 spores disposées sur deux rangs, hyalines, bicellulaires, septées au-dessus du milieu, de sorte que la cellule antérieure est plus courte et plus large que la postérieure. Les ascospores mesurent 11—12 × 4—5 μ. Les paraphysoides sont filiformes, hyalines.

Le caractère le plus frappant de cette espéce est sans contredit la forme des ascospores, ce qui la distingue des espèces trouvées jusqu'à maintenant sur des Légumineuses, soit *Didymella cladophila* (Niessl) Sacc. sur *Genista germanica* L. et *Genista tinctoria* L., *Didymella leguminosarum* Petrak sur *Coronilla* sp., *Didymella obscura* Rehm. sur *Melilotus albus* Desr., *Didymella pinodes* (Berk. et Blox.) Höhn. sur *Pisum sativum* L. et *Lathyrus odoratus* L., *Didymella trifolii* (Fuck.) Sacc. sur *Trifolium pratense* L. Seule l'espèce décrite par Petrak (1949) *Didymella cousiniae* Petr. a des spores également septées au-dessus du milieu, mais leurs dimensions sont plus du double de celles de l'espèce-ci.

En culture sur de l'agar malté *Didymella phacae* forme un abondant mycélium blanc, qui au bout de 10—15 jours perd sa

couleur et devient transparent ou légèrement rosé, en même temps que flasque et humide. Des pycnidies ne sont formées qu'en petit nombre au début, puis plus du tout par la suite. Par contre elles sont nombreuses dans les cultures ayant passé l'hiver dehors. Les pycnidies sont globuleuses, environ 200—300 μ de diamètre, brun-foncé. Les pycnidiospores sont hyalines, en bâtonnets, le plus souvent unicellulaires, mais les bicellulaire ne sont pas rares; leurs dimensions: 7—10 × 2—4 μ. Il s'agit d'une espèce d'*Ascochyta.*

Aucun doute que ce soit là la forme imparfaite de l'ascomycète, car à la fin avril, des pseudothèces ont été trouvés à côté de pycnidies dans des cultures sur paille ayant hiverné en plein air et inoculées avec des pycnidiospores ou du mycélium.

Des essais d'infection ont été entrepris sur diverses plantes afin de déterminer le degré de parasitisme de cette espèce et la répartition de ses plantes-hôtes; les résultats seront publiés par la suite.

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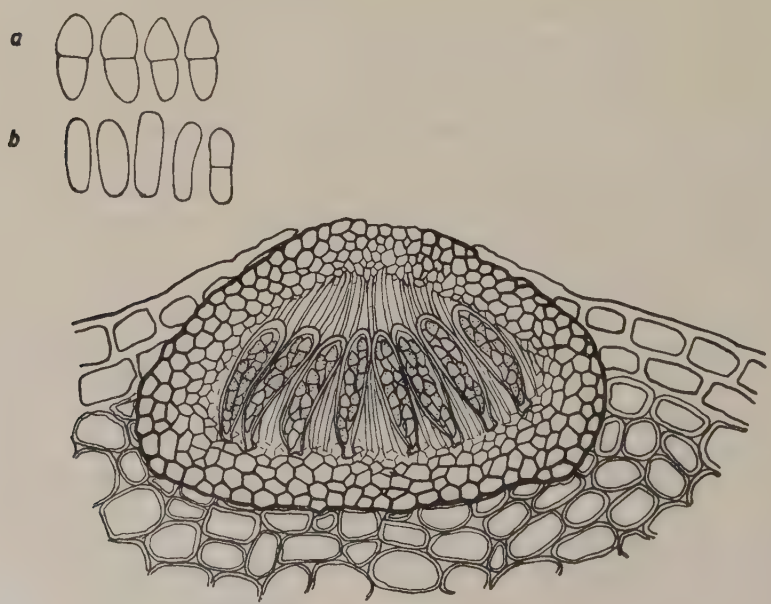

Figure 1. Coupe à travers un pseudothèca de *Didymella phacae.* Gross. 250 ×. — a) ascospores. b) pycnidiospores, toutes deux grossies 1000 ×.

Some additional notes on Crumenula de Not. and Scleroderris (Fr.) de Not.

By J. Gremmen.
(Forest Research Station T. N. O., Wageningen, Netherlands.)

In this short paper some additional information has been given on *Crumenula sororia* Karst., *Crumenula laricionis* Unam. and *Scleroderris abietina* (Lgbg.) Gremmen.

Crumenula sororia Karst., Myc. Fenn. **1**: 211. 1871.

Seaver in his North American Cup-Fungi (1951) refers *Crumenula sororia* Karst. to the genus *Godronia* and considers this fungus identical with *Atropellis pinicola* Lohman & Cash. For this fungus he cites: Journ. Wash. Acad. Sci. 30: 357. 1940.

It appears, however, that Seaver primarily made a wrong citation of the fungus, which ought to be: *Atropellis piniphilum* (Weir) Lohman & Cash, in Journ. Wash. Acad. Sci. 30: 257. 1940. Secondly the identity of *Atropellis piniphilum* and *Crumenula sororia* is incorrect.

Although both species induce canker-like wounds on *Pinus* species, the apothecia are quite distinct as for the structure of the exciple. One of the most remarkable characteristics of *Atropellis piniphilum* is the greenish- blue colour of the epithecium, which is lacking in *Crumenula sororia.*

Atropellis piniphilum probably only occurs in the United States of America and inhabits particularly *P. ponderosa* and *P. contorta,* rarely it was found on *P. albicaulis* and *P. monticola* and once it was reported from *P. taeda* (cf. Boyce, 1948).

Crumenula sororia inhabits *P. sylvestris, P. nigra* v. *corsicana, P. nigra* v. *austriaca* and *P. Cembra* in the Netherlands. In Finnland it was also observed on *P. Murrayana.*

2. *Crumenula laricionis* Unam. An. Jard. Bot. Madrid **2**: 54. 1942.

Some time ago Dr. L. Ettlinger (Eidgen. Techn. Hochsch., Zürich) informed me that in Spain a description of a new species of *Crumenula* had been published, which was named *Cr. laricionis* Unam. n. sp. The fungus occurred on the needles of *Pinus Laricio.*

This fact was not known to the present author and I am therefore very thankful to Dr. L. Ettlinger that it was possible for me to study part of the type which had been deposited in the Herbarium of the E. T. H. at Zürich. In this way I could form an opinion on this organism.

The original material has the following notes: „In foliis Pini laricionis, apud Cuenca (Hispania). VII-41, leg. Prof. Caballero, det. P. Luis M. Unamuno". An extensive description of the Discomycete has been published in 1942. Sections were made of a few apothecia and studied. It appeared that Unamunos fungus is not a *Crumenula* at all, but proved to be the fungus *Cenangium acicolum* (Fuck.) Rehm, which was already suggested from the description and the pictures.

3. *Scleroderris abietina* (Lgbg.) Gremmen. Acta Bot. Neerl. **2** (2): 234. 1953.

Shortly after the publication of the investigations on *Crumenula* and *Cenangium* (cf. Acta Bot. Neerl. 2 (2). 1953), the authors attention was directed by Miss E. K. Cash (Plant Industry Station, Beltsville, Maryland) to the incorrect name *Scleroderris abietina* (Lgbg.) Gremmen (syn. *Crumenula abietina* Lgbg.).

I am very indebted to Miss Cash for her valuable remark as it appeared that the name *Scl. abietina* (Lgbg.) Gremmen is untenable, since it is antedated by *Scl. abietina* Ell. & Ev. = *Godronia abietina* (Ell. & Ev.) Seaver). The diagnosis of the latter fungus was given in Am. Nat. 31: 427. 1897. *Scl. abietina* Ell. & Ev. is quite distinct from *Scl. abietina* (Lgbg.) Gremmen, since the ascospores of the first fungus are 50—65 ⇌ 3—4 μ (after Seaver, 1951) and the measurements of the ascospores of the latter organism 15—24 ⇌ 4—6 μ (after Lagerberg, 1913).

In honour of Prof. Torsten Lagerberg, whose name is connected with the first discovery of *Crumenula abietina* on *Picea excelsa* in Sweden, the present author proposes to alter the name of this fungus into *Scleroderris Lagerbergii* Gremmen nom. nov.

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Über einige neue oder bemerkenswerte Ascomyceten aus Pakistan. I.

Von Emil Müller und Sultan Ahmad.

(Aus dem Institut für spezielle Botanik der Eidg. Technischen Hochschule, Zürich, und dem Botany Department des Government College, Lahore, Pakistan.)

Mit 7 Abbildungen.

Aus unserer engen Zusammenarbeit bei der Bearbeitung von Ascomyceten aus Pakistan haben sich neben Formen, die sich mit schon längst bekannten Arten identifizieren liessen, auch eine Anzahl neuer Arten ergeben. Daneben haben wir auch Formen angetroffen, welche bis anhin nicht in der richtigen Gattung eingeteilt waren. Es ist uns daran gelegen, diese neuen Formen bzw. Revisionen nicht nur zu beschreiben, sondern auch möglichst gut mit Abbildungen zu belegen. In dieser ersten Mitteilung sollen einige, bis heute sicher bestimmte Formen in zwangloser Folge bearbeitet werden.

1. **Broomella montaniensis** (Ell. et Everh.) comb. nov.

Synonyme: *Lophiostoma montaniensis* E. et E. — Journ. of Myc. **4**, 64 (1888).
Ceriospora montaniensis E. et E. — North. Am. Pyr. 1891, p. 391.
Keissleria montaniensis v. H. — Ann. Myc. **16**, 94, (1918).
Marix: *Clematis* spec. (Nordamerika, Indien).

Der Pilz überzieht die Epidermis des Substrates über weite Strekken mit einer oberflächlichen, höckerigen, aus braunen, polyedrischen Zellen bestehenden Stromaplatte, welche mit hellbraunen, manchmal ziemlich dicht verwobenen Hyphen auch in die darunter liegenden Substratschichten eindringt und sie durchwuchert. Die Perithecienstromata sind dem Substrat vollständig eingesenkt, stehen aber in Reihen hintereinander, sodass sie die Rinde in Längsrissen aufbrechen. Sie sind kugelig, unregelmässig zylindrisch oder knollig, 400—600 μ gross und sitzen mit flacher Basis dem Holzkörper auf. Oft dringen sie mit einem ziemlich dichten Geflecht aus hyalinen oder subhyalinen Hyphen in dessen oberste Zellschichten ein. Im Innern sind sie hellgelb bis schwach bräunlich gefärbt, fleischig und bestehen aus polyedrischen, 6—10 μ grossen, ziemlich zartwandigen Zellen. Seitlich und oben wird das Stroma durch eine aus dunkleren, meist deutlich braunen, derbwandigen, 8—14 μ grossen Zellen aufgebaute Kruste abgeschlossen, die allmählich in das Innengewebe übergeht.

Die Stromata enthalten ein, zwei oder mehrere, kugelige oder ellipsoidische, 150—360 μ grosse Perithecien, welche eine häutige,

manchmal fast weichfleischige, aus zahlreichen Lagen von stark zusammengepressten, zartwandigen, gelblichen, 5—10 μ langen Zellen bestehende Wand besitzen. Nur im Scheitelbereich wird sie dunkler und ist aus etwas derbwandigeren, bräunlichen Zellen aufgebaut. Aussen geht die Wand ohne scharfe Grenze in das Stromagewebe über, nach innen löst sie sich in sehr zartwandige, hyaline Zellen auf. Die Mündung ist zylindrisch, bricht durch die Stromakruste nach aussen und ist bis 100 μ hoch und fast ebenso breit. Sie ist von einem 40—60 μ weiten Kanal durchbohrt und ihre Wand besteht aus gestreckten, ziemlich zartwandigen, bräunlichen Zellen, welche in pa-

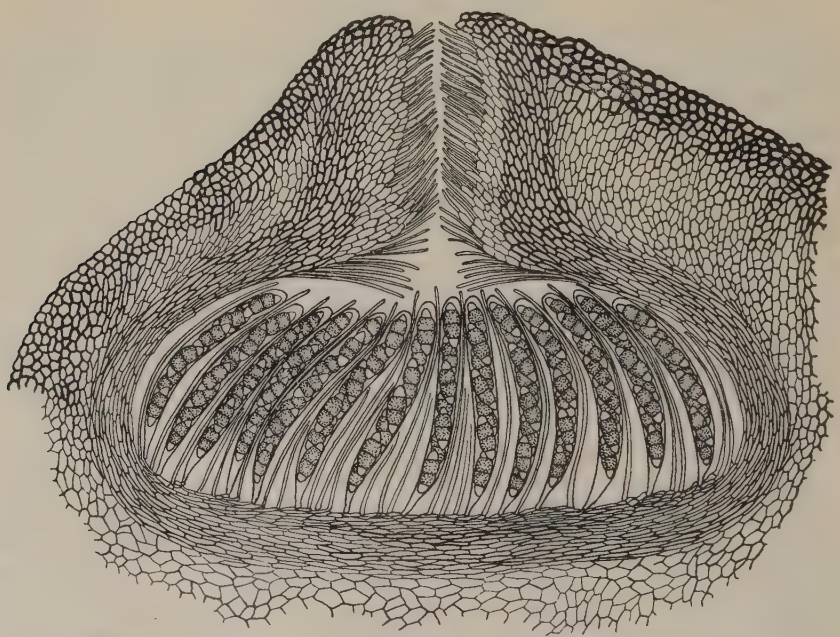

Abb. 1. Schnitt durch eine Stromapartie von *Broomella montaniensis*. Vergr. 250 mal.

rallelen Reihen angeordnet sind, schräg nach oben in den Mündungskanal hineinragen und sich zu äusserst in fädige Periphysen auflösen.

Die zylindrischen, 110—140 ⇌ 11—14 μ grossen Asci stehen parallel und sind der ganzen Fruchtkörperbasis aufgewachsen. Sie sind zartwandig, an der Basis in einen kurzen Stiel zusammengezogen und am Scheitel mit etwas verdickter Membran und mit Jod nur schwach färbbaren Apikalstruktur versehen. Die zu je acht schräg einreihig im Ascus liegenden Sporen sind ellipsoidisch-spindelförmig, meist schwach gekrümmt, 16—23 ⇌ 7—8 μ gross und durch drei Quer-

wände vierzellig. An den Querwänden sind sie eingeschnürt; die beiden mittleren Zellen sind durchschnittlich grösser als die äusseren und rotbraun gefärbt, die äusseren gegen das Ende zu verjüngt, hyalin und beide mit einer 6—14 μ langen und 1—1.5 μ breiten Zilie versehen. Paraphysen sind nur spärlich vorhanden.

Auf demselben Material kommt gemischt mit *Broomella* eine Nebenfruchtform mit ganz gleich wie die Ascosporen gebauten und auch gleich grossen Konidien vor. Diese besitzen ebenfalls an ihrem oberen Ende eine Zilie, während an ihrem unteren Ende der fest mit ihr verwachsene Stiel haften bleibt und ebenfalls eine Zilie vortäuscht. Dieser Pilz wurde von Petrak (1953) als *Ahmadinula excelsa* beschrieben und ist sehr wahrscheinlich die Nebenfruchtform unserer *Broomella.*

Broomella montaniensis, zuerst bei *Lophiostoma,* später von den Autoren bei *Ceriospora* eingereiht, wurde von v. Höhnel (1918) untersucht und bei seiner neuen, auf *Ceriospora xantha* Sacc. basierenden Gattung *Keissleria* eingereiht. Später (1920) erkannte er die Identität von *Keissleria* mit *Broomella* Sacc. ohne jedoch nochmals auf *Broomella montaniensis* einzutreten. Durch unseren Fund, den wir mit dem von Ellis und Everhart in North Amer. Fungi. Nr. 3119 ausgegebenen Exemplaren vergleichen konnten, ist es uns möglich geworden, den Pilz zu untersuchen und es unterliegt keinem Zweifel, dass v. Höhnel's Auffassung richtig war.

Fundort: Pakistan, Changla gali, ca. 2700 m, 24. 9. 1949, auf *Clematis* spec. leg. Sultan Ahmad.

2. **Ophiobolus indigoferi** nov. spec.

Perithecia dispersa, sub cortice nascentia, demum libera, globosa, vel leviter depressa, 400—600 μ diam., in parte basali hyphiis brunneis ornata. Ostiolo cylindraceo, perforato, setulis brunneis, ad 150 μ longis obsito. Pariete perithecii 30—45 μ crasso, e pluribus stratis cellularum, plus minusve compressarum, brunnearum composito. Asci numerosi, cylindracei vel leviter clavati, 250—300 ⇌ 22—28 μ, 8-spori, basi stipitati. Sporidia bacillaria, brunnea, septis pluribus constricta, 230—280 ⇌ 7—9 μ. Paraphyses filiformes.

Hab. sub cortice *Indigoferi* spec. — Pakistan, Kalam, 19. 8. 1952, leg. Sultan Ahmad (sub Nr. 8043).

Die kugeligen oder etwas niedergedrückten, 400—600 μ grossen, am Grunde in einem mehr oder weniger dichten Filz von braunen, septierten, bis 10 μ dicken Hyphen sitzenden Fruchtkörper entstehen zerstreut unter der Rinde, heben diese aber ab und werden dadurch oberflächlich frei. Sie besitzen eine zylindrische, 100—150 μ hohe, anfänglich von einem Gewebe aus kugeligen, hyalinen, ziemlich zartwandigen Zellen verschlossene, sich erst spät mit einem un-

regelmässigen Kanal öffnende Mündung, welche ringsum mit braunen, bis 150 μ langen am Ende stumpfen Borsten besetzt ist. Die Gehäusewand ist 30—45 μ dick und besteht aus zahlreichen Lagen von braunen, zusammengepressten, derbwandigen, 8—15 μ grossen, nur zu äusserst polyedrischen, eine dicke Kruste bildenden Zellen, welche ohne scharfe Grenze in das Fruchtkörperinnere übergehen.

Die zahlreichen zylindrisch oder schwach keuligen, 250—300 ⇌ 22—28 μ grossen, 8-sporigen, am Scheitel breit abgerundeten, dick- und doppelwandigen, am Grunde deutlich gestielten Asci sind von 6—8 μ breiten, hyalinen, zelligen, oft verschleimenden Paraphysoiden

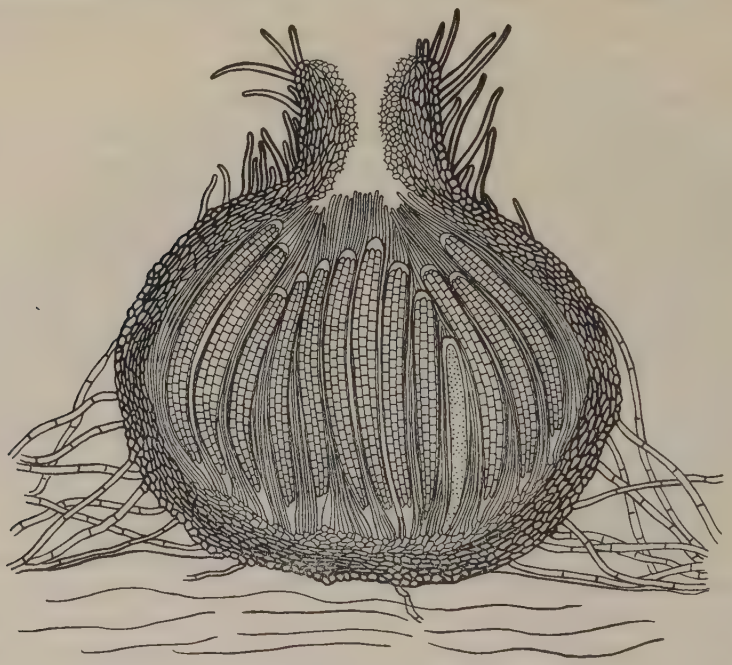

Abb. 2. Schnitt durch einen Fruchtkörper von *Ophiobolus indigoferi*. Vergr. 125 mal.

umgeben. Die Sporen sind ebenso lang wie die Asci, fädig, durch zahlreiche (meist über 20) Querwände unterteilt, an diesen eingeschnürt, braun, 230—280 ⇌ 7—9 μ und liegen parallel nebeneinander.

Ophiobolus indigoferi zeichnet sich vor allem durch die sehr langen und relativ dicken, mit zahlreichen Septen versehenen Sporen und durch die behaarten, grossen Perithecien aus und ist dadurch leicht kenntlich.

3. **Euryachora paeoniae** nov. spec.

Stromata sub cuticula nascentia, maculi elliptici, ca. 1 cm longi formantes, e cellulis angulata-rotundatis, 5—10 μ longis composita.

Loculi 40—80 μ diam., globosi vel leviter depressi, parietis 10—20 μ crassis circumdati. Ostiolo papillato, primum claudo demum aperto. Asci non numerosi, late ellipsoidei, 30—35 ⇌ 12—15 μ, sine pediculo sessiles, 8-spori. Sporidia ellipsoidia vel clavata, ca. medium septata et leviter constricta, hyalina, 13—15 ⇌ 4.5—5.5 μ.

Hab. in caulibus emortuis *Paeoniae* spec. — Pakistan, Kalam (swat state), 21. 8. 1952 et 23. 8. 1952. leg. Sultan Ahmad (sub Nr. 4772 et 4774 = Typus).

Der Pilz bildet auf dem Substrat elliptische, in der Faserrichtung gestreckte, ca. 1 cm lange, schwarze, matte Flecken. Diese werden durch schichtenweise unter der Kutikula, häufig auch noch in der Epidermis wachsende Stromata verursacht, welche sich aus polyedrischen, 5—10 μ grossen, dickwandigen, braunen Zellen zusammensetzen. Darin eingesenkt oder sich auch als selbständige Konzeptakel differenzierend, finden sich in grosser Zahl 40—80 μ grosse, kugelige

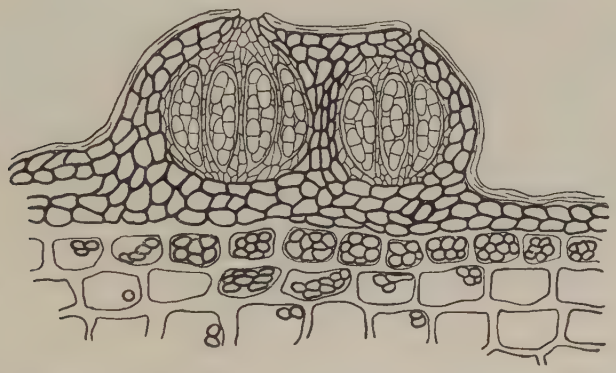

Abb. 3. Schnitt durch eine Stromapartie von *Euryachora paeoniae*. Vergr. 330 mal.

oder auch schwach niedergedrückte, von 10—20 μ dicken Wänden umgebene Loculi. Diese besitzen am Scheitel eine meist ziemlich atypische, anfänglich geschlossene, später sich durch einen unregelmässigen Porus öffnende, von länglichen, subhyalinen, ziemlich zartwandigen Zellen umgebene Mündung.

Die nicht sehr zahlreichen, meist nur bis höchstens 20 sich in einem Fruchtkörper bildenden Asci sind breit ellipsoidisch, 30—35 ⇌ 12—15 μ gross, am Scheitel breit abgerundet, am Grunde ohne Stiel sitzend und besitzen eine derbe, doppelte Membran. Sie sind von den Resten des paraphysoiden Gewebes umgeben und enthalten je acht ellipsoidisch-keulige, in der Mitte septierte und schwach eingeschnürte, 13—15 ⇌ 4.5—5.5 μ grosse, hyaline Sporen.

Der Pilz wurde mit dem Typus von *Euryachora,* Fuck. [*E. thoracella* (Rostr.) Schroet.] verglichen. Er entspricht dieser Form weitgehend, besitzt aber grössere Loculi, Asci und Sporen.

4. **Haematomyxa pakistani** nov. spec.

Ascomata sub cuticula erumpentia, superficialia, disciformia, atra, 500—650 μ diam., 180—250 μ alta. Excipulum in parte basali e cellulis hyalinis vel subhyalinis, plus minusve angulato-rotundatis, 5—8 μ diam., in latere e stratis cellulorum subhyalinis vel fuscis. Asci numerosi, late cylindracei, apice rotundati, brevissime stipitati, 95—110 ⇌ 28—34 μ, 8-spori. Sporae distichae, late ellipsoideae vel fusoideae, transverse 12-pluriseptatae, longitudinaliter pluriseptatae, fuscae, 32—44 ⇌ 13—17 μ. Paraphyses filiformes, ramosae, 2—3 μ crassae, ad apicem incrassatae et epithecium crassum brunneum formantes.

Hab. in ramis *Berberidis* — Pakistan, Murree, leg. Sultan Ahmad (sub. Nr. 8039) (Typus) et in ramis *Acaciae modestae* Wall. Pakistan. Salt Range: Choa Saidan Shuck, 13. 3. 1950, leg. Sultan Ahmad (sub. Nr. 3087).

Die unter der Kutikula angelegten, später durchbrechenden, scheibenförmigen oder stark nach oben gewölbten 500—650 μ grossen und 180—250 μ hohen Ascomata sitzen mit der ganzen Basis auf dem Substrat und dringen mit einzelnen Hyphenkomplexen in die obersten Zellschichten ein. Das Excipulum besteht an der Basis aus 5—10 μ grossen, polyedrischen, nicht sehr dickwandigen, subhyalinen Zellen, welche nur ganz zu äuerst bräunlich werden und eine dunklere Kruste bilden; seitlich besteht es aus parallelen Reihen von schwach gestreckten bräunlichen Zellen. Das Excipulum geht ohne scharfe Grenze in das aus hyalinen, zartwandigen Zellen bestehende Hypothecium über. Die parallel nebeneinander stehenden, breit zylinderischen, 95—110 ⇌ 28—34 μ grossen, achtsporigen Asci besitzen eine derbe, doppelte Membran und sind am Grunde in einen kurzen Stiel zusammengezogen. Sie sind von breit-fädigen, sich über ihnen verzweigenden und sich vielfach verflechtenden, gegen die Spitze sich verbreiternden und bräunlich werdenden Paraphysen umgeben, welche gegen oben ein braunes, manchmal fast krustenartiges Epithecium bilden. Die ellipsoidisch-spindelförmigen, beidendig sich verjüngenden, mauerförmig geteilten, mit meist mehr als 12 Querwänden und vielen Längswänden versehenen, gelbbraunen Sporen messen 32—44 ⇌ 13—17 μ.

Die Gattung *Haematomyxa* Sacc. umfasst nur wenige, ziemlich schlecht bekannte Arten. Seaver (1951) gibt gute Abbildungen von *Haematomyxa vinosa* (Cke. et Ell.) Sacc. und *Haematomyxa appendi* Ell. et Ev. Selber hatte ich Gelegenheit *Haematomyxa bambusina* Rac. zu untersuchen, welche — allerdings noch etwas jung — trefflich mit unserem Pilz übereinstimmt, aber in der Mitte deutlich eingeschnürte Sporen besitzt. Hinsichtlich seiner systematischen Stellung gehört er in die Nähe von *Patellaria* Fr. und *Johansonia* Sacc. und

bildet mit diesen Gattungen eine natürliche Gruppe, welche nicht zu den *Lecanorales* (vgl. z. B. Nannfeldt, 1932), sondern zu den *Dothiorales* sensu von Arx et Müller (1954) zu stellen ist.

5. **Pyrenopeziza lavaterae** nov. spec.

Apothecia sparsa, interdum in epidermide evoluta, mox erumpentia et plus minusve libera, sessilia, obconica, 250—300 μ lata et 180—230 μ alta. Excipulo basi 40 μ crasso, parenchymatico, fuscocano, externe atro brunneo, marginaliter 20 μ crasso et in cellulis regulariter et hyphas hyalinis dissoluto. Asci clavati breve stipitati, 8-spori, 50—60 ⇌ 8—9 μ. Sporidia disticha, fusoidea, recta vel leviter curvulata, con-

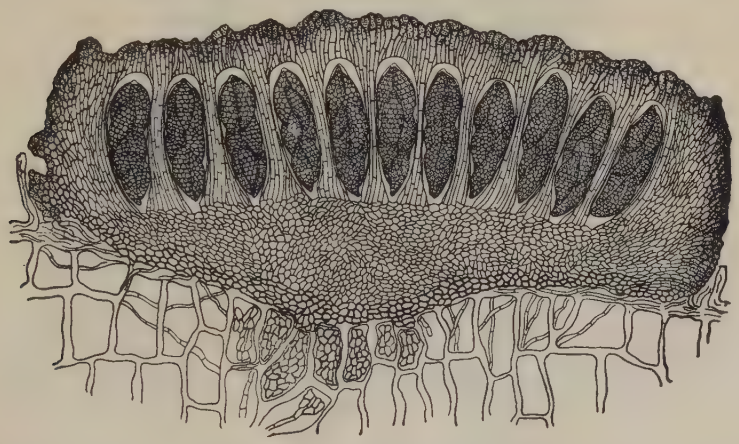

Abb. 4. Schnitt durch ein Ascoma von *Haematomyxa pakistani*. Vergr. 170 mal.

tinua, hyalina, 12—14 ⇌ 1,5—2 μ. Paraphyses hyalinae, filiformes, ascos subsuperantes.

Hab. in caulibus emortuis *Lavaterae Kachmirianae* Camb. — Pakistan, Kagan valley, 25. 7. 1951, leg. Sultan Ahmad.

Die im Substrat ziemlich dicht verteilten, unter der Epidermis entstehenden, später durchbrechenden und sich fast oberflächlich frei machenden, niedergedrückt ellipsoidischen Apothecien sind 250—300 μ breit und 180—230 μ hoch. Sie sitzen dem Substrat mit breit abgerundeter Basis auf. Das Excipulum ist an der Basis 40 μ dick und besteht aussen aus mehr oder weniger regelmässig vieleckigen, zunächst ziemlich derbwandigen, gegen innen zarteren, braunen, meist in drei bis vier Lagen angeordneten, 8—12 μ grossen Zellen. Nach innen folgt ein Parenchym aus zartwandigeren und hyalinen, meist auch etwas kleinern und parallel epipedischen Zellen. Distal wird das Excipulum dünner (ca. 20 μ) und überragt marginal das

Hymenium um 10—20 μ. Hier werden die Zellen länglich und fasern zuletzt in aussen schwach angeschwollene, und subhyaline, innen bräunliche Hyphenglieder aus.

Die parallel nebeneinander stehenden Asci sind keulig oder etwas spindelförmig, am Grunde ziemlich breit, aber kurz gestielt und am Scheitel fast spitz verjüngt, 50—60 ⇌ 8—9 μ gross. Sie werden von zahlreichen, fädigen, hyalinen Paraphysen überragt und enthalten je acht spindelförmige, manchmal fast zylinderische, meist gerade, oder schwach gekrümmte, einzellige, hyaline, 12—14 ⇌ 1,5—2 μ grosse Sporen.

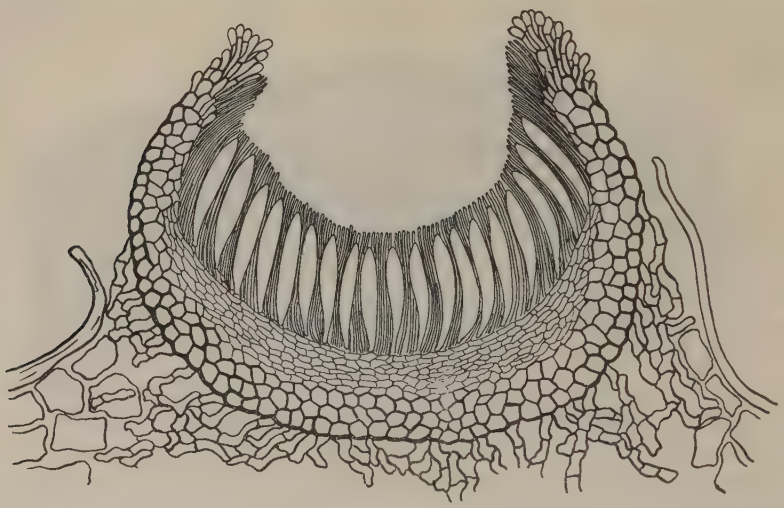

Abb. 5. Schnitt durch ein Apothecium von *Pyrenopeziza lavaterae*. Vergr. 250 mal.

Pyrenopeziza lavaterae gehört in dieselbe Gruppe wie *Pyrenopeziza Chailletii* Fuck., Typus der Gattung.

6. **Diaporthopsis spiraeae** nov. spec.

Perithecia sub cortice nascentia, depressa, 250—400 μ lata, 180—350 μ alta, clypeo stromatico tecta; ostiola 100—150 μ lato et alto, saepe excentrico, erumpente, poro periphysato aperto. Pariete peritheciorum duplex, pars exterior 25—45 μ crassa, e cellulis plus minusve cubicis, brunneis, 14—20 μ diam.; pars inferior 10—15 μ crassa, e cellulis hyalinis, compressatis, 20—30 μ longis et 5—8 μ crassis formata. Asci ellipsoidei vel saccati, 46—56 ⇌ 11—13 μ. Sporae ellipsoideae vel cylindraceae, hyalinae, 11—14 ⇌ 5—6 μ, epispori crassi; sine paraphysibus.

Hab. in caulibus emortius *Spiraeae Lindleyanae* Wall. = *Spiraeae sorbifoliae* L. Pakistan, Swat state, 19. 8. 1952, leg. S. Ahmad.

Die einzeln oder in kleinen Gruppen unter der Rinde wachsenden Perithecien sind niedergedrückt kugelig, 250—400 μ breit und 180—350 μ hoch. Sie brechen mit einer 100—150 μ breiten und ebenso hohen, oft excentrischen, scheitelständigen Mündung hervor und wölben die Rinde pustelförmig auf. Von der Mündung aus zieht sich ein dunkles, aus ziemlich derbwandigen, 10—20 μ grossen, unregel-

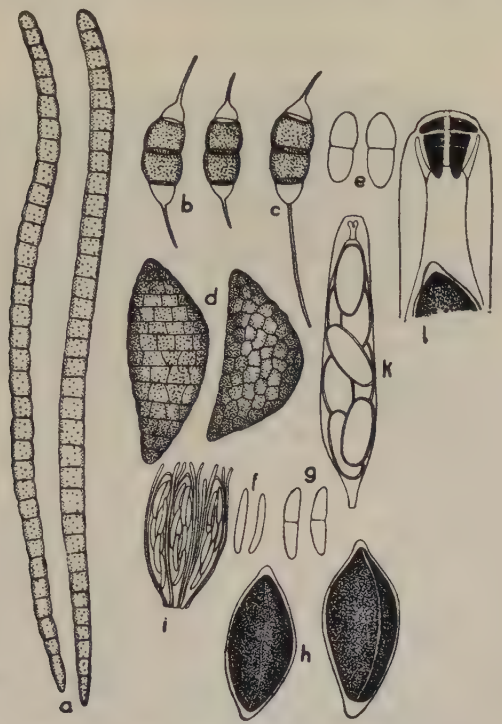

Abb. 6. Sporenformen von a) *Ophiobolus indigoferi,* Vergr. 330 mal. b) *Broomella montaniensis,* c) *Ahmadinula excelsa,* d) *Haematomyxa pakistani,* e) *Euryachora paeoniae,* f) *Pyrenopeziza lavaterae,* g) *Mycosphaerella dalbergiae,* h) *Penzigia quercus,* Vergr. 660 mal, i) Asci von *Pyrenopeziza lavaterae, Vergr.* 330mal, k) Ascus von *Diaporthopsis spiraeae,* Vergr. 330 mal, l) Ascusspitze von *Penzigia quercus* mit Apikalapparat (gefärbt mit Jod-Jod-Kalium), Vergr. 660 mal.

mässigen, oft ineinander verschlungenen Zellen bestehendes Stroma in die Rinde hinein und bildet einen deutlichen Klypeus. Die Mündung selber ist von einem 50—70 μ breiten, meist an der Peritheciensansatzstelle halsartig verengten, von vielen fädigen Periphysen durchwachsenen Porus durchbohrt. Dieser wird von senkrecht parallel angeordneten, innen ziemlich zartwandigen und subhyalinen, aussen derbwandigen, goldbraun bis dunkelbraun gefärbten Hyphengliedern

umfasst, welche seitwärts ohne scharfe Grenze in den Klypeus übergehen. Die Perithecienwand ist zweischichtig. Die äussere, 25—45 μ dicke Partie besteht aus mehr oder weniger kubischen, derbwandigen, meist in mehr oder weniger deutlichen Schichten angeordneten, 14—20 μ Durchmesser aufweisenden, dunkelbraun gefärbten Zellen. Innen schliesst sich eine 10—15 μ dicke Partie aus stark abgeplatteten, bis 30 μ langen und 5—8 μ breiten, hyalinen, ziemlich zartwandigen Zellen an.

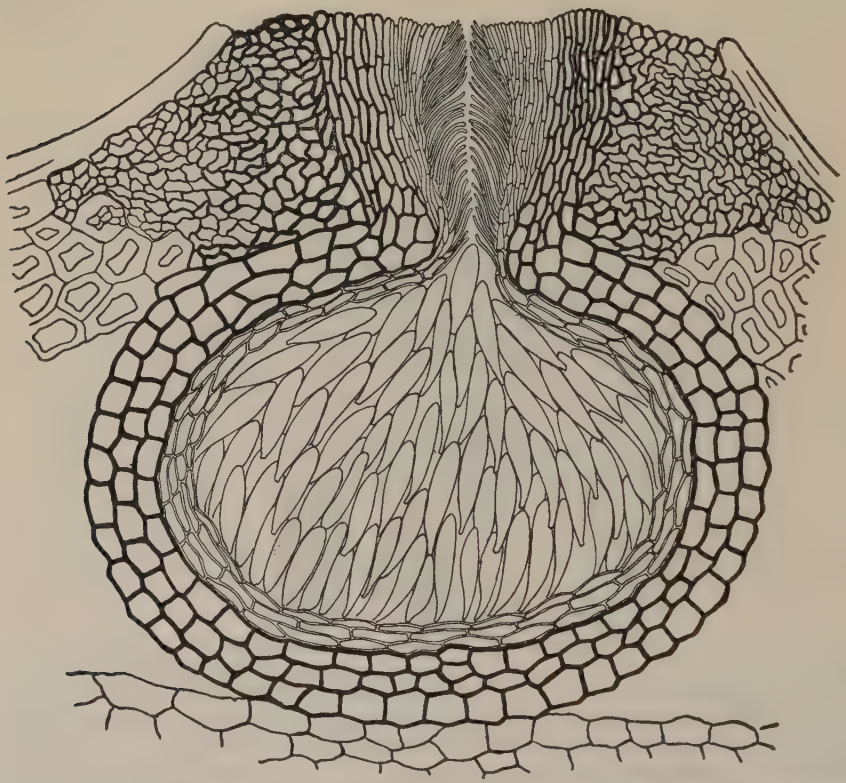

Abb. 7. Schnitt durch einen Fruchtkörper von *Diaporthopsis spiraeae*. Vergr. 250 mal.

Der ganze Innenraum ist erfüllt von den ellipsoidischen oder unten etwas sackartig erweiterten, 46—56 ⇌ 11—13 μ grossen, mit einem verschleimenden Stiel versehenen und sich daher leicht von der Wand lösenden Asci. Diese sind einfach- und zartwandig, nur am Scheitel mit einer etwas verdickten Membran versehen, wo sich auch ein stark lichtbrechender Apikalring befindet. Sie enthalten je acht ellipsoidische bis undeutlich zylinderische, mit einem deutlichen Epispor versehene, hyaline, 11—14 ⇌ 5—6 μ grosse Sporen.

Diaporthopsis spiraeae gleicht habituell sehr stark *Ditopella ditopa* (Fr.) Schröter und unterscheidet sich von dieser Gattung nur durch die achtsporigen Asci. Von *Diaporthopsis angelicae* (Berk.) Wehm. weicht er durch die stärkere Ausbildung des epidermalen Klypeus, sowie durch die nicht schnabelartig vorragende Mündung ab; die Art nähert sich *Clypeoporthella Brencklei* Petr., welche von v. Arx und Müller (1954) zu *Diaporthopsis* gestellt wurde.

7. **Mycosphaerella dalbergiae** nov. spec.

Perithecia plerumque epiphylla, in maculis brunneis nascentia, solitaria vel saepe gregaria, globosa vel ellipsoidea, 60—120 µ diam. Ostiolo late papilliforme, poro 10—20 µ late punctiformiter pertuso. Pariete perithecii membranaceo, pseudoparenchymatico 10—15 µ crasso, e cellulis brunneis, regulariter angulatis formato. Asci sat numerosi, cylindraceo-clavati, crassiuscule tunicati, sessiles vel brevissime stipitati, 8-spori, 35—40 ⇌ 7—9 µ. Sporae di- vel tristichae, oblongae vel fusoideae, rectae vel saepe curvatae, circa medium septatae et non constrictae, hyalinae, 12—14 ⇌ 2,5—3,5 µ.

Hab. in foliis emortuis *Dalbergiae sissoo* Roxb. Pakistan, Ladhar, Sheikhupura, 15. 4. 1951 (sub. Nr. 2987), leg. S. Ahmad.

Der Pilz durchwuchert das gesamte Blatt mit einem aus goldbraunen, gegliederten und vielfach ästigen Hyphen bestehenden Geflecht; er löst die Zellen des Schwammparenchyms und des Palisadengewebes häufig vollständig auf und vermag nur die Leitbündel, sowie einzelne Epidermispartien nicht anzugreifen. Die kugeligen oder senkrecht ellipsoidischen, 60—120 µ grossen, Fruchtkörper wachsen herdenweise in rundlichen, 1—5 mm grossen, durch Zusammenfliessen aber oft weite Blattpartien überziehenden, dunklen, meist nur auf der Blattoberseite deutlich sichtbaren Flecken. Sie sind selten vollständig frei, häufiger zu wenigen miteinander vollständig verwachsen oder durch stromatische, subkutikulare, epidermale oder gar subepidermale, manchmal nur hautartige, dann aber auch wieder sehr dicke, aus parenchymatischen, braunen Zellen bestehenden Stromaplatten miteinander verbunden. Sie besitzen eine schwach vorragende, anfangs geschlossene, sich später mit einem rundlichen Porus öffnende Mündung und ihre Gehäusewand ist 10—15 µ dick und besteht aus ziemlich derbwandigen, regelmäsig vieleckigen, braunen, 4—7 µ grossen Zellen.

Die büschelig aus einem vorgewölbten Basalpolster entspringenden, zylinderisch-keuligen, 35—40 ⇌ 7—9 µ grossen Asci sind derb- und doppelwandig, am Scheitel breit abgerundet und an der Basis kurz knopfig gestielt, 8-sporig. Sie sind ohne Paraphysen dicht aneinander gedrängt. Die zwei- bis dreireihig liegenden, ellipsoidisch-spindelförmigen, oft gekrümmten, hyalinen, in der Mitte septierten Sporen messen 12—14 ⇌ 2,5—3,5 µ.

Diese Art, die als Hauptfruchtform der von Sydow (1933) beschriebenen *Cercospora sissoo* Syd. zu betrachten ist, fällt durch die stromatischen Komplexe und die oft miteinander verwachsenen Perithecien auf. Sie gehört in die von v. Arx (1949) aufgestellte Sektion *Cymadothea,* weicht aber von den übrigen, bisher dazu gestellten Arten durch die *Cercospora*-Nebenfruchtform ab.

8. **Penzigia quercus** nov. spec.

Stromata solitaria vel gregaria, superficialia, hemisphaerica, 0,8—1 mm diam., basi brevissime stipitata; pars exterior 100—200 µ crassa, e cellulis brunneis, 4—7 µ diam., angulato-rotundatis composita; pars interior hyalina, ex hyphis 2—3 µ crassis composita. Perithecia non numerosa vel solitaria, globosa, 570—820 µ diam., tecta, ostiolo papilliforme praedita. Paries perithecii fuscus, e stratis pluribus cellularum compressarum, 2—4 µ crassarum compositus. Asci numerosi, cylindracei, stipitati, unitunicati, 160—200 ⇌ 13,5—16,5 µ, 8-spori. Sporae late fusoideae, fuligineae, 24,5—39 ⇌ 11—16 µ, rima germinativa et episporio crasso praeditae. Paraphyses numerosae, hyalinae.

Hab. in cortice *Quercus dilatatae* Lindl. Pakistan, Murree, ca. 2100 m. s. m. 8. 8. 1953, leg. S. Ahmad.

Die einzeln oder gruppenweise dem Substrat aufsitzenden, halbkugeligen, 0,8—2 mm grossen Stromata sind an der Basis zusammengezogen und mit einem kurzen Stiel im Substrat verankert. Aussen besitzen sie eine 100—200 µ dicke, aus sehr derbwandigen, dunkelbraun bis fast opak schwarz gefärbten, nur ein enges Lumen frei lassenden, 4—6 µ grossen, mehr oder weniger polyedrischen Zellen bestehende, dunkle Kruste, welche zu äusserst schollig abbröckelt. Innen ist es hyalin und setzt sich aus eng ineinander verschlungenen, hyalinen, fädigen, oft in parallelen Bündeln gelagerten, 2—3 µ breiten Hyphen zusammen. Es enthält nur wenige Perithecien, zuweilen sogar nur ein einziges. Diese sind kugelig, 570—820 µ gross, vollständig von der Aussenkruste bedeckt und nur mit einer papillenförmigen, von einem 40—60 µ breiten und innen mit zahlreichen Periphysen besetzten Kanal durchbohrten Mündung nach aussen brechend. Die Perithecienwand ist bräunlich und 40—60 µ breit. Aussen geht sie ohne scharfe Grenze in das hyaline Stromageflecht über und oft sind im oberen Drittel auch die umgebenden Stromapartien bräunlich gefärbt. Sie besteht aus zahlreichen Lagen von stark abgeplatteten, 2—4 µ breiten Zellen, welche nach innen in ein dichtes Geflecht aus hyalinen Hyphen übergehen.

Die der ganzen inneren Wand entlang angeordneten, zylinderischen, 160—200 ⇌ 13,5—16,5 µ grossen, am Scheitel breit abgerundeten Asci sind zartwandig. Ihre Membran ist nur in der Scheitelpartie

verdickt und mit einem, sich teilweise mit Jod färbbaren Apikalapparat versehen. Sie sind von zahlreichen, fädigen, hyalinen, oft schwach verschleimenden Paraphysen überragt und enthalten je acht breit spindelförmige, dunkelbraun bis fast schwarz gefärbte, 24,5—39 ≒ 11—16 μ grosse, einzellige Ascosporen, welche durch einen sich der ganzen Länge nach ziehenden Keimspalt ausgezeichnet sind. An den Enden sind sie oft etwas ausgezogen und mit einem stark verdickten Epispor versehen, welches im übrigen etwa 1 μ dick ist.

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Zur Pilzvegetation aufgeforsteter Fichtenwälder.

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Studien zur Soziologie und Ökologie der höheren Pilze gewinnen langsam, aber stetig an Interesse. Es sei auf die ausgezeichneten Sammelreferate von W. Bridge Cooke (1948—1953) verwiesen, ferner auf Hueck's (1953) Besprechung der pilzsoziologischen Untersuchungsmethoden. Eine Reihe von Arbeiten behandelt das Pilzvorkommen in natürlichen Wäldern verschiedener Typen. So hat Leischner-Siska Buchenwälder um Salzburg (*Fagetum praealpinum*), Pirk nordwestdeutsche Laubwälder (*Querceto-Carpinetum*) geprüft und Favre (1948) die Pilzvegetation von Hoch- und Zwischenmooren und angrenzenden Fichten-, Föhren- und Birkenwäldern im Schweizer Jura und Voralpengebiet von soziologischen Gesichtspunkten aus eingehend untersucht.

Im September des regenreichen Jahres 1954, das durch besonderen Pilzreichtum ausgezeichnet war, habe ich mich — im Raume um Bayreuth — vornehmlich mit der Pilzvegetation, nicht natürlicher Waldtypen, sondern aufgeforsteter Fichtenwälder orientierend beschäftigt. Solche Bestände, die den beschatteten Boden fast vegetationsfrei lassen, sind vom allgemein pflanzensoziologischen Standpunkt wenig interessant. Die Baumschicht besteht ausschliesslich aus *Picea excelsa,* die Strauchschicht fehlt, die Moosschicht deckt weniger als ein Zehntel und entspricht einem Initialstadium, sie beschränkt sich auf einzelne Inseln, wo der Boden etwas mehr Licht als die Umgebung erhält; im übrigen ist der Waldboden nur von einer dicken Nadelstreuschicht bedeckt, die der natürlichen Aufarbeitung durch Pilze und Kleintiere unterliegt. Jeder Praktiker weiss, dass in solchen Fichtenaufforstungen der Pilzwuchs besonders reich, der Pilzertrag ein besonders hoher ist, — übereinstimmend mit dem Satze Leischner-Siska's (1939, S. 364), „dass die pilzreichsten Stellen die phanerogamistisch leersten Stellen sind und umgekehrt".

Die vom Fichtenwald bester Ertragsklasse erzeugte Holzmasse übertrifft wesentlich die vom Rotbuchen- und Eichenwald erzeugte. Rechnet man die durch Forstungserträge („Vornutzungen") mit ein, so sind — nach Tschermak (1950, S. 402, 412, 712) — für 100 jährigen Bestand die Verhältniszahlen: Fichte 1163 fm, Buche 826 fm, Eiche 706 fm (Festmeter). Wie mir Herr Prof. L. Tschermak freundlich mitteilt, wird der Fichtenwald allgemein wegen des erfor-

derlichen Bestandesschlusses, zur Erzielung von Bodenbeschattung usw. dicht gepflanzt. Mit zunehmendem Standraum scheidet ein Teil der Bäumchen im Konkurrenzkampf aus, die Durchforstung greift vor. Den Bestand nach Entnahme der Vornutzungen bezeichnet man als den verbleibenden; aber was heute verbleibt, kann morgen auch Vornutzung werden. —

Die im folgenden mitzuteilenden Aufnahmen sind in einem Fichtenjungwald nächst Glashütten, welches 11 km westlich von Bayreuth am Nordfuss des oberfränkischen Braunjura-Höhenzuges zwischen Neubürg und Altenhimmel liegt, im September 1954 durchgeführt worden. Ich habe das Gebiet von früher her als pilzreich gekannt und in früheren Jahren auch Hochsommeraspekte aufgezeichnet. Der dichte Fichtenwald ist auf altem Nadelwaldboden gepflanzt; im Jahr 1916 wurde im Gebiet massenreicher Fichtenbestand durch Sturmkatastrophe geworfen. Genauere Lokaldaten bleiben nachzutragen, wenn über weitere Beobachtungen, die am Standort geplant sind, berichtet werden wird.

Die Beobachtungsfläche war im Umkreis von 10 m um einen auffallenden, dichten Hexenring von *Ramaria stricta* gelegen, wobei aber der Teil des Kreises, der einem etwa 8 m breiten Waldstreifen vom Waldrande her angehört, ausgeschaltet blieb. Die im übrigen homogene Fläche umfasst ungefähr 250 m², womit der „Minimalraum" im Sinne der Pflanzensoziologie (vgl. Braun-Blanquet 1951, S. 88 f.) wenigstens annähernd erreicht wird. Der geologische Untergrund ist unterer brauner Jura (Opalinuston); die Fläche ist leicht (ca. 3—5°) nach Ost geneigt, also frei von stagnierendem Grundwasser. An Moosen gab es stellenweise runde Decken von *Minium rostratum* mit Einzelstämmchen von *Thuidium tamariscinum,* dazu nur wenig *Hypnum cupressiforme, Hylocomium proliferum, Dicranum scoparium.* Es fehlen *Pleurozium Schreberi* und *Dicranum undulatum,* die in den feuchten Föhrenwäldern des Bayreuther Keupers häufig sind.

Die erste Aufnahme fand am 6. Sept. 1954 statt. Während im Voralpen-Fichtenwald der Ramsau bei Schladming, die ich am 1. Sept. verlassen hatte, der Pilzwuchs bis dahin gegenüber anderen Jahren sehr zurückgeblieben, augenscheinlich durch die kühlfeuchte Witterung retardiert war, fand ich in Bayreuth anfangs September schon eine üppige Vegetation entwickelt, die wohl dem Maximalaspekt entspricht: Im *Piceetum montanum* bei 1100—1200 m Seehöhe erscheint die Temperatur, hier die Feuchtigkeit als begrenzender Faktor. — Die zweite Aufnahme erfolgte am 20. September. In der Zwischenzeit herrschte mildes Wetter mit anfangs spärlichen, dann reichlichen Niederschlägen. Es war das Pilzwachstum im Jahr 1954 überhaupt durch keine Trockenzeit unterbrochen worden, wie dies in anderen Jahren im Bayreuther Raum meistens der Fall ist.

In der folgenden Tabelle bedeutet die erste Zahl die Häufigkeit (Abundanz) — sie wird nach den bei Höfler (1938) bezeichneten Richtlinien, aber nur auf Grund von Schätzung, nicht von Zählung und Wägung beurteilt — die zweite Zahl die Häufungsweise (Soziabilität); an Stelle dieser Zahlen sollen bei künftigen Aufnahmen der Pilzvegetation die von Darimont am Pariser Botanikerkongress 1954 vorgeschlagenen Symbole treten.

	Aufnahme v. 6. Sept. 1954	Aufnahme v. 20. Sept. 1954
Otidea leporina	+ . 1	1 . 2
Calocera viscosa	+ . 1	+ . 1
Ramaria stricta Pers.	1 . 3	2 . 3
Ramaria cineria Bull.	1 . 2	2 . 2
Clavaria ligula Schaeff.	+ . 2	+ . 2
Xerocomus (Boletus) chrysenteron (Bull.) Quel.	2 . 1	(+A)
Lactarius torminosus Schaeff.	+ . 1	
Lactarius glyciosmus Fr.	+ . 1	
Lactarius rufus (Scop.) Fr.	2 . 2	+ . 2
Lactarius mitissimus Fr.	+ . 1	
Russula integra L.		+ . 2
Russula paludosa Britz.	+ . 1	
Russula nitida Fr.	+ . 2	(+)
Russula puellaris Fr.	1 . 2	
Hygrophorus agathosmus Fr.	+ . 1	
Clitocybe clavipes Pers.	1-2 . 1	
Clitocybe sp. 1 *)	+ . 1	+ . 2
Clitocybe sp. 2 *)	+ . 2	+ . 2
Laccaria laccata (Scop.) Bk. u. Br.		1 . 1
Collybia asema Fr.	1 . 1	
Tricholoma saponaceum Fr.		+ . 1
Marasmius perforans Hoffm.	2 . 4	2 . 4
Marasmius alliaceus Jacq.	+ . 1	+ . 1
Mycena epipterygia Scop.		3 . 4
Mycena elegans Pers.		3 . 2
Mycena metata (Fr.) Quel.		2 . 2
Mycena vgl. *sepia* Lange		+ . 1
Mycena lactea Pers.		+ . 1-2
Mycena pura Pers.	+ . 2	
Amanita vaginata (Bull.) Quel.	1 . 1	
Amanita pantherina (Cand.) Secr.		+ . 1
Amanita porphyrea Fr.	+ . 1	
Myxacium mucosum Bull.	1 . 1	1 . 1
Phlegmacium multiforme Fr.	+ . 1	
Dermocybe cinnamomea L., s. l.		+ . 1
Telamonia brunnea Pers.		+ . 2
Hydrocybe armeniacea Schaeff.	2 . 1	
Hydrocybe rubricosa Fr. **)		+ . 2
Hydrocybe fasciata Fr. ***)	+ . 1	3 . 3
Lycoperdon gemmatum Batsch.	1 . 2	1 . 2

*) Nicht nachgeprüft, Bestimmung bleibt nachzutragen.

**) (?) Sporen 7½—8 × 4½—5 µ.

***) Stimmt gut mit Abb. bei Lange, aber Sporen nur 6—7(—8) µ × 4—5 µ.

Beim Vergleich beider Aufnahmen wirkt überraschend, wie sehr sich das äussere Bild in den zwei Wochen gewandelt hat. Der Pilzaspekt (Höfler 1954, Friedrich 1954) ist völlig verändert. Eine Reihe der am 6. Sept. üppig entwickelten Pilze ist verschwunden, zahlreiche andere Arten sind neu aufgetreten. Nur langlebige Fruchtkörper der Clavariaceen, Marasmien und von *Lycoperdon* haben sich erhalten. Besonders fiel auf, dass die Vertreter der Gattung *Mycena* schon am 20. Sept. das Feld beherrschten. — Friedrich (1940, S. 39) hat in seinen Untersuchungen zur Ökologie der höheren Pilze unter den jahreszeitlichen Aspekten im Buchenklimaxwald um Wien den *Russula*-Aspekt im Frühsommer, *Lactarius vellereus*-Aspekt im trockenen Hochsommer, einen artenreichen Maximal-Aspekt im Früherbst, dann den *Limacium eburneum*-Aspekt im Oktober und den *Mycena*-Aspekt, der meist in den feuchten Spätherbst fällt, unterschieden (vgl. Scheerpeltz und Höfler 1948, Höfler 1954). Friedrich fand auch für künstlich aufgeforstete Fichten- und Tannenwälder im Buchenklimaxgebiet des Wienerwaldes im allgemeinen einen *Russula*-Aspekt im Sommer und *Mycena*-Aspekt im Spätherbst charakteristisch. Mir war aus meinen Beobachtungen in der Wiener Umgebung nicht klar geworden, ob die Mycenen etwa eines Frostes bedürfen, bevor sie ihre Fruchtkörper erscheinen lassen, — wie das z. B. beim Nebeltrichterling, *Clitocybe nebularis*, der Fall ist — oder ob die Mycelien nur für ihr vegetatives

Lufttemperaturen und Niederschlagsmengen Bayreuth ($H_s = 358$ m NN); 20. August bis 20. September 1954.

	7h	14h	21h	Niederschlag im mm		7h	14h	21h	Niederschlag in mm
20. VIII.	9.9°	20.2°	14.6°	9.5	5. IX.	13.6°	26.1°	17.2°	.
21.	14.1	20.4	16.5	5.9	6.	15.2	22.5	15.4	0.9
22.	14.6	14.2	12.4	5.9	7.	14.6	21.2	15.0	.
23.	11.2	13.6	10.2	22.1	8.	13.5	20.5	15.0	20.0
24.	10.1	18.2	11.8	0.1	9.	14.4	20.8	14.2	0.5
25.	7.8	21.4	12.7	0.5	10.	13.6	21.0	15.6	.
26.	13.2	20.4	12.6	2.2	11.	16.0	22.2	16.8	0.0
27.	9.5	22.2	13.7	6.1	12.	13.1	14.1	11.0	2.1
28.	8.5	23.4	13.1	.	13.	11.2	16.2	9.0	0.7
29.	11.7	19.4	13.8	0.0	14.	8.4	14.4	10.5	0.0
30.	14.1	16.6	16.0	.	15.	11.2	16.9	10.4	1.0
31.	14.2	20.2	15.8	.	16.	12.0	16.9	15.4	0.0
1. IX.	13.1	27.6	17.5	.	17.	10.0	13.9	10.0	5.7
2.	14.1	29.6	19.1	.	18.	11.0	13.1	11.9	.
3.	17.2	26.4	17.4	.	19.	15.0	16.8	14.8	9.4
4.	15.4	26.7	18.0	.	20.	14.4	16.6	10.8	17.4

Die mittleren Niederschlagssummen (1891—1930) sind am Juranordfuss etwas höher als in Bayreuth. Sie betragen 595 mm für Bayreuth (363 m Seehöhe), — 736 mm für Busbach (430 m Seehöhe), 799 mm für Trokau (530 m Seehöhe).

Wachstum in der durchfeuchteten oberen Bodenschicht einer gewissen Entwicklungsperiode bedürfen, bis sie ins Fruchtstadium treten. Die Tatsache, dass sich der *Mycena*-Aspekt hier im feuchten Jahr 1954 schon am 20. Sept. in bester Entwicklung findet, lässt die Frage klar im Sinne der zweiten Alternative beantworten. Denn die folgende Zusammenstellung der metereologischen Daten, die ich durch Herrn Oberlehrer K. Kronberger's Vermittlung dem Wetteramt Nürnberg des Deutschen Wetterdienstes verdanke, zeigt, dass nicht nur keine Fröste, sondern auch keine starke Abkühlung vorangegangen war.

Die beiden aufgezeichneten Aspekte sind so artenreich, dass man sie schwer durch Einzelspezies bezeichnen kann. Als unterscheidende Arten sind für den Frühherbst-Maximalaspekt vom 6. Sept. etwa kennzeichnend die Täublinge, *Clitocybe clavipes,* und *Boletus chrysenteron,* der dann vom Goldschimmel völlig aufgezehrt wurde, — für den herbstlichen „Kleinpilzaspekt" vom 20. Sept. vor allem die Mycenen und ein kleiner Wasserkopf, vgl. *Hydrocybe fasciata.*

Für den Waldrandstreifen (Aufnahmefläche II) waren am 6. Sept. die Pilze *Boletus edulis, Amanita spissa, Psalliota silvatica,* am 20. Sept. *Russula ochroleuca* und *Tricholoma nudum* kennzeichnend, Arten, die hier nicht ins Innere der Fichtenaufforstung reichen. Im Jungwald fehlt auch *Limacium olivaceoalbum,* welches ein Charakterpilz älterer Fichtenwälder (vgl. z. B. Favre 1948, S. 178) ist und bei meiner Wanderung in solchen am 6. Sept. auch im Gebiet häufig angetroffen wurde.

Ich schliesse Auszüge aus weiteren, bloss orientierenden Aufnahmen vom 20. Sept. an. Die betreffenden Örtlichkeiten waren am 6. Sept. begangen, die Pilze aber nicht im einzelnen aufgenommen worden; damals war vielfach noch ein spätsommerlicher *Russula-Inoloma traganum*-Aspekt ausgebildet.

In einem Quadrat III von 10 × 10 m, unweit im flachen, gleichalten Fichtenwald über Opalinuston gelegen, war die Pilzvegetation von der nahen, auf leicht geneigtem Boden gelegenen Aufnahmefläche I schon stark verschieden. *Hydrocybe leucopoda* Fr. (3—4. 3) dominierte, *H. rubricosa* (1. 2—3) und *H. fasciata* (2. 4) waren häufig, die meisten Mycenen fehlten noch. Es handelt sich um einen ausgesprochenen „Cortinarien-Aspekt".

In einem IV. Quadrat (strassenaufwärts bei „Stein 14" westlich der Strasse gelegen) war ebenfalls *H. leucopoda* (2. 4) in Dominanz, die Pilzvegetation aber bereichert um *Polyporus confluens, Russula ochroleuca, Lactarius mitissimus, Psaliota silvatica, Inoloma traganum, Amanita muscaria;* im westlich angrenzenden, feuchteren, durch die Moose *Bazzania trilobata* und *Sphagnum* sp. unterschie-

denem Gebiet bestimmte streckenweise *Lactarius vietus* (bis 4.4) den Aspekt.

Wesentlich anders sah die Pilzflora bergaufwärts, wo man den Eisensandstein des braunen Jura (Doggen β) *) betritt, in äusserlich ähnlichen, aufgeforsteten Fichtenbeständen aus. In einer Beobachtungsfläche V von 10 × 10 m war auch hier am 20. Sept. am häufigsten *Hydrocybe leucopoda* (2.3—4) und *Marasmius perforans,* dazu kamen aber ein *Cortinarius* (wohl wieder *Hydrocybe rubricosa*) 2—3.2, *Russula* vgl. *fragilis* 1.1, *Ixocomus (Boletus) piperatus* 1.1, *Trachypus (Boletus) versipellis* +, *Lactarius helvus* +, *Amanita muscaria* + und nahe am Waldrand *Russula badia.* Als Differentialarten gegenüber den früheren Aufnahmen erscheinen u. a. *Boletus piperatus* und *versipellis.*

Weiter oben am Nordhang des Braunjurazuges wurden noch die Pilze in jungen Fichtenpflanzungen beobachtet. In einem erst 3—6 m hohen Wald hatte sich die grüne Feldschicht mit dem Gras *Deschampsia flexuosa* noch zum Teil erhalten, sonst war der Boden schon von Nadelstreu eingenommen. Auf grossen Feldern war — als Mycorrhizapilz der jungen Fichten — *Lactarius rufus,* strichweise war *Lactarius necator* der häufigste Pilz, anderseits hatte sich um die Grasflecke *Gomphidius glutinosus* erhalten. (Am Waldrand gegen eine Schneise wurden etilche Arten notiert, die aber nicht mehr zur Gesellschaft gehören). Die Pilzvegetationen in solchen Jungwäldern sind Mischungen, denen noch keine soziologische Individualität zukommt, sie sind von der Vegetation abhängig, die vor der Aufforstung geherrscht hat.

Demgegenüber stellen die Pilzvegetationen der älteren Fichtenaufforstungen Kleingesellschaften dar, die soziologisch durchaus erfasst werden können. Während der Fichtenwald aufwächst und periodisch durchforstet wird, folgen wohl mehr oder minder gesetzmässig mehrere solche Pilzgesellschaften nacheinander. In der Bodenschicht finden Sukzessionen statt, indes die Baumschicht ohne Änderung in der Artenzusammensetzung einfach heranwächst.

Im Abschnitt Sukzessionslehre seiner Pflanzensoziologie bezeichnet Braun-Blanquet (1951, S. 457) die einzelnen, mehr minder regelmässig aufeinanderfolgenden Assoziationen als Stadien einer Serie, die Entwicklungsstufen innerhalb einer Assoziation aber als deren Entwicklungs-Phasen. Nach dieser in der Pflanzensoziologie eingebürgerten Terminologie (vgl. Lüdi 1930) bestimmt somit die wechselnde Pilzflora der Bodenschicht Phasen in der Entwicklung der Grossgesellschaft Fichtenwald. Dagegen wird man wohl von auf-

*) Über die Zuordnung der Pilzvegetation zu geologischen Horizonten der Trias und des Jura in Württemberg vgl. die grundlegende Studie von Haas (1932).

einanderfolgenden Stadien der Pilz-Kleingesellschaften selbst sprechen könne, die mitsammen eine Serie („Kleinserie") bilden, wo sie sich gesetzmässig ablösen. Dem Endzustand im erwachsenen Fichtenforst entspräche dann eine Schlussgesellschaft der Pilze. Spezielle Studien in dieser Richtung wären eines der Arbeitsziele der Pilzsoziologie, sie bleiben freilich Untersuchern vorbehalten, denen es vergönnt ist, das Geschehen des Vegetationswandels jahrelang am selben Platze zu beobachten.

Rasch wechselnde Sukzessionsserien, deren Glieder aber doch klar erfasst werden können, sind von der Pilz- und Moosvegetation vermodernder Baumstrünke her bekannt. Analoge Sukzessionen sind schon eingehender in der Tiersoziologie studiert worden. Ich erinnere an das Kleintierleben in Substraten, die einer schnellen Veränderung unterworfen sind, im Dünger, in Äsern oder aber in frischen und verwesenden Pilzen (Scheerpeltz und Höfler 1948, S. 308—323), wo die Besiedlungsfolge durch verschiedene Käfer klare Serien erkennen lässt. Dort folgen die einzelnen Stadien noch viel rascher aufeinander. —

Was unsere Sukzessionsreihe der Pilzgesellschaften im heranwachsenden künstlichen Fichtenwald betrifft, so sind da die Stadien zweifellos durch Differentialarten gekennzeichnet. Aus ihnen werden sich bei weiterem Studium wohl wirkliche Charakterarten herausheben lassen. Vom synökologischen Standpunkt ist solches naturgemäss noch nicht versucht worden. Aber die reichen autökologischen Angaben, die sich in unseren klassischen Pilzwerken finden, können schon wertolle Anhaltspunkte geben. So bringt z. B. J. E. Lange's Werk über die Agaricineen Dänemarks für *Mycena lactea* und *M. elegans* die Angabe „in dense plantations of *Picea*". „On the needle bed" oder „in deep needle bed of *Picea*" finden sich *M. rosella, M. metata, M. vulgaris,* zwischen Nadeln von *Pinus* und *Picea M. sepia,* auf toten Nadeln von *Abies M. plicosa,* zerstreut im Nadelbett von Coniferen-Wäldern *M. zephira.*

Näheres Studium der Pilze in Fichtenaufforstungen wird weiter zumal auch zeigen müssen, welche Arten sich mehr oder minder allgemein in Pflanzungen und im Jungwald einstellen und welche nur solchen Wäldern eigentümlich sind, die auf altem Fichtenwaldboden neu aufgeforstet wurden. Analoge Unterschiede für Gefässpflanzen sind in der Pflanzensoziologie wohl bekannt. So kennzeichnen nach Braun-Blanquet in den Alpentälern *Listera cordata, Pirola uniflora* und *Lycopodium annotinum* als Charakterarten ein gut entwickeltes, echtes *Piceetum subalpinum.* Die Arten fehlen naturgemäss in Fichtenaufforstungen auf ursprünglichem Buchenwaldboden.

Ich habe im Sept. 1954 nur einige erste Beobachtungen in dieser Richtung angestellt. So besuchte ich gleich am 7. Sept. 1954 unter

K. Kronberger's Führung das von ihm mykologisch studierte Revier um Neuenreuth (über Burgsandstein im Bayreuther Keuper, vgl. auch Höfler 1954). In einer Parzelle mit aufgeforsteten Fichten (*Picea* 5.5, *Pinus silvestris* 1.1), wo der nadelstreubedeckte Boden fast vegetationsfrei war, wurden an Pilzen notiert: *Phlegmacium collinitum* 2.2, *Cantharellus tubaeformis* 1.3, *Boletus edulis* 1.1, *Boletus badius, Amanita rubescens, Russula emetica, Russula sanguinea, Paxillus involutus, Lactarius rufus, L. helvus, L. vietus, Marasmius perforans* — also eine Gesellschaft, die von der gleichzeitig im Glashüttner Fichtenwald entwickelten völlig abweicht. Ringsum stand Rotföhrenwald mit dichter Moosschicht von *Pleurozium Schreberi* und *Dicranum undulatum,* gut entwickelter Zwergstrauchschicht von *Vaccinium myrtillus* und viel spärlicherem Pilzwuchs.

Einer jüngst erschienenen Arbeit von Kreisel (1954, S. 299) über die Pilzflora einiger Hoch- und Zwischenmoore Ost-Mecklenburgs entnehme ich folgende Angabe über „Künstliche Fichtenbestände" (*Piceetum nudum*): „Im Randgebiet des Klein Kieshofer Moores wurden auf Moorerde Fichten angepflanzt, untermischt mit Kiefern und Lärchen. Heute ist der Boden dick mit Rohhumus und Reisig bedeckt, und unter dem dichten Nadelgehölz gedeihen nur wenige kümmerliche Krautpflanzen und Moose. Die Pilzflora dieses Bestandes ist gänzlich anders geartet als in den bisher besprochenen Assoziationen. Rohhumusbewohnende Arten treten in grosser Individuenzahl auf, häufig Hexenringe u. dgl. bildend: *Clitocybe pityophila, C. gilva, C. tuba, C. nebularis, C. suaveolens, Rhodopaxillus nudus, Mycena pura, Marasmius perforans, Agaricus arvensis* subsp. *arvensis. A. silvaticus, Ramaria palmata, Calvatia saccata* var. *pistilliformis* und als Besonderheit *Lepiota rhacodes* var. *puellaris.*

Mykorrhizabildende Arten erscheinen nur vereinzelt: *Lactarius rufus, Gomphidius glutinosus, Xerocomus badius, Hydnum repandum* und — auf einer grasigen Schneise — *Lactarius deliciosus.*"

Auf meinen Wanderungen habe ich vielfach bestätigt, dass die „Produktivität" (vgl. Bässler 1944) des Bodens in von grünen Pflanzen leeren Fichtenforstungen höher ist als die des Bodens in alten Fichtenwäldern. Das zeigte sich wieder besonders anschaulich am 7. Sept. auf einer (vorwiegend algologisch ausgerichteten) Exkursion unter K. Kronberger's Führung ins Fichtelgebirge, in die Naturschutzgebiete der Seelohe und Hüttenlohe und der umliegenden Höhen (vgl. Kronberger 1954).

Am 26. Sept. hatte ich endlich noch Gelegenheit, Fichtenhochwälder in der Umgebung von Grünwald bei München zu besuchen, in denen sich ein ziemlich reicher Pilzbestand fand. In einem Wald (über kalkreichem Moränenboden), dessen Boden soviel Licht empfing, dass eine dichte und üppige Moosschicht aus *Hylocomium*

proliferum, Polytrichum attenuatum, Hypnum crista castrensis u. a. entwickelt war, herrschten *Lepiota amianthina* in Hexenringen und *Clitocybe* sp., hinzu kam ein artenreicher aber individuenarmer Pilzbestand (*Russula cyanoxantha, Tricholoma argyraceum, Lepiota cristata, Lactarius lignyotus* u. a.); wenige Arten waren hier und im Bayreuther Fichtenwald gemeinsam. In einer dichteren Fichtenpflanzung ohne grüne Feld- und Moosschicht von ähnlichem Alter wie die oben behandelten war *Russula foetens* Pers. dominant, von kleinen Hutpilzen waren *Inocybe-Arten* reichlich vertreten.

Jedenfalls liessen mich die mitgeteilten Aufnahmen und orientierenden Beobachtungen des Pilzjahres 1954 erkennen, dass dem Lebensort Jungfichtenwald bzw. aufgeforsteter Fichtenwald (*„Piceetum nudum"*) nicht eine Pilzbiocönose entspricht, sondern dass zahlreiche, in ihrem Artbestand sehr verschiedene Pilzgesellschaften an dem für das Pilzwachstum so besonders förderlichen Lebensort gedeihen. Es genügt also nicht, dem Biotop *Piceetum nudum* Pilzbiocönosen zuzuordnen, sondern die Notwendigkeit wird offenbar, die Pilzaspekte einzeln in ihrer jahreszeitlichen Folge aufzunehmen und daraus nach aufsteigend-floristischer Methode Pilzgesellschaften zu erarbeiten.

Wenn dies geschehen ist, wird man auch an den Versuch herantreten können, Fichtenwälder und Fichtenforste als Waldentwicklungstypen im Sinne Aichinger's durch ihre Pilzvegetation zu kennzeichnen.

Herrn K. Kronberger-Bayreuth, dem Regierungsbeauftragten für Naturschutz in Oberfranken, und Frau Grete Kronberger bin ich für mehrere Bestimmungen und für die Überlassung von Lange's Tafelwerk zu herzlichem Dank verbunden.

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Kulturversuche mit Ascomyceten II.

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Mit 2 Textabbildungen.

7. **Amphididymella Ahmadi** nov. spec.

Im Herbst 1954 erhielten wir von Herrn Dr. Sultan Ahmad (Lahore, Pakistan) eine Sendung Pilze, welche er im August 1954 gesammelt hatte. Darunter fanden wir zwei sehr ähnliche, auf dürren Zweigen von *Berberis* resp. *Smilax* wachsende Ascomyceten, die sich durch zweizellige, hyaline Sporen auszeichneten und möglicherweise in die uns zur Zeit stark interessierende Gattung *Didymella* Sacc. gehörten. In beiden Fällen fanden wir auf dem Substrat auch eine Sphaeropsideae, deren Gehäuse denen der Ascusform sehr ähnlich waren und welche im Innern an langen, öfters verzweigten Konidienträgern einzellige, hyaline Konidien abschnürten. Da wir in den aus dem Ascomyceten hervorgegangenen Kulturen genau gleich gebaute Konidienformen fanden, ist für diesen, zur Formgattung *Dendrophoma* Sacc. gehörenden Imperfekten die Zugehörigkeit zum Entwicklungszyklus unseres Ascomyceten erwiesen.

Die morphologische Untersuchung der beiden Substratformen ergab nicht nur ihre spezifische Identität, sondern auch ihre Zugehörigkeit zu der von Petrak (1928) aufgestellten Gattung Amphididymella. Innerhalb dieser Gattung stellt dieser Pilz eine neue Art dar, welche wir Herrn Dr. Sultan Ahmad zu Ehren benennen wollen und der sich folgendermassen beschreiben lässt:

Amphididymella Ahmadi nov. spec.

Status ascophorus: Perithecia dispersa, plerumque solitaria, raro 2—3 subaggregata, immersa, leniter depressa, 250—300 μ diam., clypeo atro e cellulis 5—8 μ crassis, compressis composito tecta, erumpentia, stromate e cellulis hyalinis vel subhyalinis in telam vicinam penetrantibus, insidentia. Ostiolum planum, canalis solidis brunneis setulis ornatus. Paries peritheciorum subhyalinus vel brunneus, 15—20 μ crassus, e cellulis plus minusve compressis, 8—12 μ crassis. Asci satis numerosi, clavati, bitunicati, 90—110 ⇌ 13—15 μ, 8-spori. Sporae ellipsoideo-fusoideae, hyalinae, medio septatae, ad septum valde constrictae, 14—17 ⇌ 5—6 μ, loculus superior paulo latior.

Status conidiophorus: Pycnidia saepe proxime perithecia, ellipsoidea non raro irregularia, tanta crassa quanta perithecia. Paries e cellulis parum depressis, 8—12 μ crassis, brunneis. Conidiophora filiformia, hyalina, saepe 1, raro 2 ramosa, 10—40 μ longa; sporulae ellipsoideae vel bacillariae, hyalinae, 5—7 ⇌ 2—2,5 μ.

Hab. in caulibus emortuis *Smilacis parvifoliae* Wall. — Pakistan, Murree, 2100 m. s. m. 10. 8. 1954, leg. S. Ahmad sub. Nr. 11016. et *Berberidis* spec. — Pakistan, Rawalpindi, 6. 8. 1954, leg. S. Ahmad, sub. Nr. 11083.

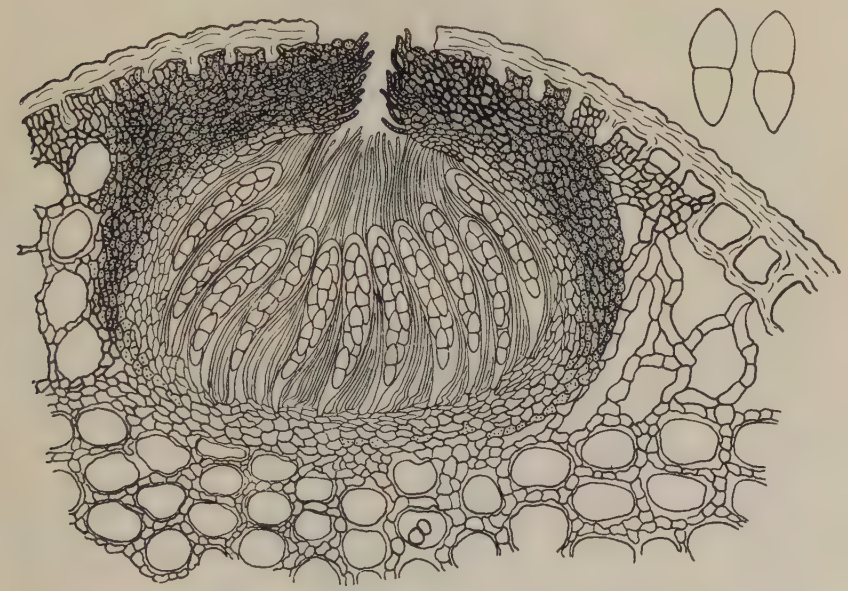

Abb. 1. Schnitt durch ein Stroma von *Amphididymella Ahmadi*. Vergr. 250 mal, Ascosporen 1000 mal.

Hauptfruchtform:

Die einzeln oder zu kleinen Gruppen dem Substrat eingesenkten, kugeligen oder meist etwas niedergedrückten, 250—320 μ grossen Perithecien sind von einem dunklen, fast opak scheinenden Klypeus bedeckt. Dieser besteht aus 5—8 μ grossen, nicht sehr derbwandigen, schwach zusammengepressten, von einem braunen Inhalt erfüllten Zellen, welche die Epidermis meist vollständig durchwuchern, daneben aber auch in tiefere Zellschichten eindringen. Von den Perithecien aus dringt ein hyphiges Stroma aus hyalinen oder subhyalinen Zellen weit in das umliegende Gewebe ein, durchwächst vor allem die Zwischenzellwände und vermag auch einzelne Substratzellen zu erfassen. Die Perithecien wölben die Epidermis auf und brechen sie im Bereich ihrer Mündung rissig auf. Die Mündung selber

ist flach und besteht nur aus einem innen mit derbwandigen, braunen, ziemlich kurzen, oft stumpfen Borsten besetzten Kanal. Die Gehäusewand ist unter dem Klypeus subhyalin bis schwach braun, 15—20 μ dick und besteht aus zusammengepressten, ziemlich zartwandigen, 8—12 μ grossen Zellen.

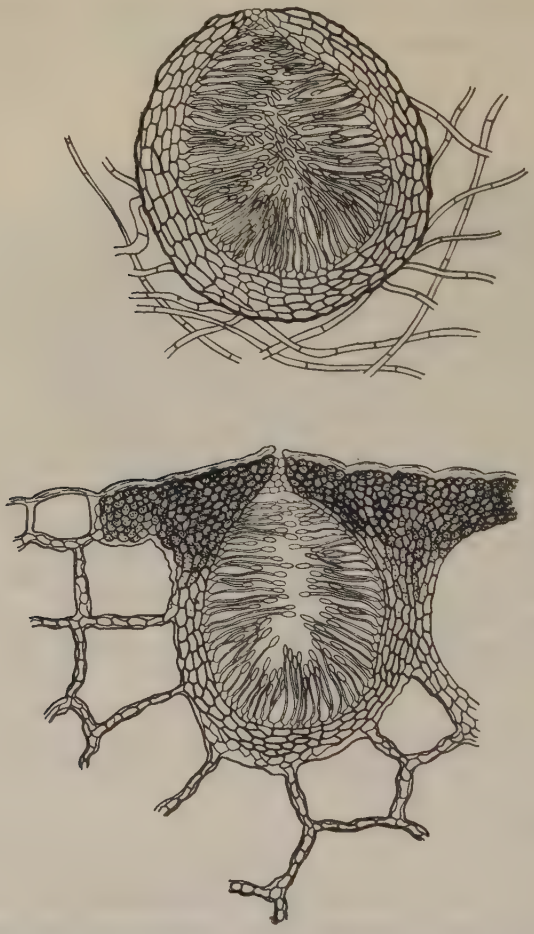

Abb. 2. *Amphididymella Ahmadi*, Konidienform, oben Pyknidium aus der Reinkultur, unten Pyknidium von *Berberis*. Vergr. 250 mal.

Die ziemlich zahlreichen Asci sind keulig, derb- und doppelwandig, 90—110 ⇌ 13—15 μ gross und von zahlreichen fädigen Paraphysoiden umgeben. Die zu je acht im Ascus liegenden Sporen sind ellipsoidisch-spindelförmig, 14—17 ⇌ 5—6 μ gross, hyalin, in der Mitte septiert und stark eingeschnürt. Die Oberzelle ist meist ganz schwach breiter als die untere.

Nebenfruchtform:

Die entweder einzel stehenden oder sich an diejenigen der Hauptfruchtform anlehnenden Fruchtkörper sind hochgestellt ellipsoidisch, oft sehr unregelmässig geformt und von ungefähr derselben Grösse, oft aber auch eher etwas kleiner als die Hauptfruchtform. Sie sind ebenfalls vom Klypeus bedeckt. Ihre Wand besteht aus etwas zusammengepressten, 8—12 μ grossen, hellbraunen Zellen. Innen entspringen der ganzen Wand entlang aus höckerig vorstehenden, zartwandigen, hyalinen Zellen fädige, oft ein- seltener zweimal verzweigte, 10—40 μ lange Konidienträger, welche an ihren Enden je eine ellipsoidische, manchmal fast stäbchenförmige, hyaline, 5—7 ⇌ 2—2,5 μ grosse Konidien abschnüren.

Wie wir schon oben erwähnten, wurde der Pilz von beiden Substraten isoliert. Dazu liessen wir Ascosporen auf sterilen Agarnährboden ausschleudern. Die daraus entstehenden Kolonien wachsen bei Zimmertemperatur ziemlich langsam. Sie bilden ein dunkles Substratmycel und ein helles, später oft sich grau färbendes Luftmycel. Die jungen Hyphen sind dünn (1,5—2 μ dick) und farblos, im Alter werden sie dicker (4,5—5 μ) und dunkelbraun, soweit sie im Substrat sitzen. Die Bildung von Pyknidien erfolgt auf Malzagar bei Zimmertemperatur nur in einem sehr spärlichen Masse. Mehr Pyknidien erhielten wir dagegen in Kulturen auf demselben Nährboden, welche aber während zwei Monaten (Mitte November bis Mitte Januar) den Aussentemperaturen ausgesetzt worden waren. Irgendwelche Unterschiede zwischen den beiden Substratformen bestehen nicht, sodass auch die Kultur das Ergebnis der morphologischen Untersuchung bestätigt, wonach sie zu ein und derselben Art gehören.

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Russula-Flora Österreichs.

Mit besonderer Berücksichtigung der Umgebung Wiens.

Von T. Cernohorsky und H. Raab (Wien).

Mit 1 Textfig.

Im Jahre 1934 erschienen in den Annales Mycologici die Vorarbeiten zur Russulaflora Österreichs von T. Cernohorsky und R. Singer. Im Anschluss daran soll nun nach 20 Jahren eine Ergänzung folgen.

In dieser Arbeit haben wir uns entschlossen, die Reihenfolge mit den Arten, die den Lactarien näher stehen, zu beginnen und so den phylogenetischen Zusammenhang hervorzuheben. Für die Anordnung der Arten und ihre makroskopische Unterscheidung ist die Verfärbung des Fleisches von Wichtigkeit. Fehlt dieses Merkmal, so wird die Bestimmung schwierig. Um nun leichter zum Ziel zu gelangen und die Schwierigkeiten in der Literatur zu überbrücken, soll uns die Zusammenstellung der gleichen Hutfarben helfen, aus dem Wirrwarr herauszukommen.

Weiters wird es auch notwendig sein, die Beschaffenheit der Huthaut festzustellen, die, glatt, rauh, schmierig, aderig, punktiert, gerieft oder durch ein anderes Merkmal ausgezeichnet sein kann. Eine grosse Rolle spielt auch die Farbe der Lamellen, ihre Anordnung, ob sie weit oder eng beisammen stehen, ob sie steif oder biegsam sind. Auch Merkmale des Stieles und des Fleisches, dessen Geschmack und Geruch müssen wir berücksichtigen. Mit Hilfe dieser Merkmale sind die Schwierigkeiten zu überwinden, die uns bei der Bestimmung vieler *Russula*-Arten begegnen. Die hochentwickelten Arten, die durch ihre feine, fast durchsichtige Hutoberhaut ausgezeichnet sind, sollen den Abschluss bilden.

Erst dann, wenn uns auf Grund der makroskopischen Merkmale eine genaue Bestimmung gelungen ist, soll die mikroskopische Untersuchung beginnen.

Wichtig wären Farbentafeln. Leider sind wir durch die derzeit unerschwinglichen Druckkosten nicht in der Lage, solche zu bringen. Vielleicht ist es uns später einmal möglich, dieselben zu veröffentlichen.

Am Schluss danken wir allen jenen, die zum Gelingen dieses Werkes beigetragen haben.

I. *Delica*-Gruppe. — Weisse Täublinge. — Hut weisslich, im Alter oft braunfleckig, meist rauh, Lamellen und Stiel weisslich, Fleisch weiss, fest. Geschmack scharf.

1. *R. glaucophylla* (Quel.) Sing. 1932. Milchlingstäubling.

Syn.: *R. delica* Fr. var. *glaucophylla* Quel. 1901. — *Agaricus chloroides* Krombh. 1843. — *Lactarius exsuccus* Smith 1873.

Icon.: *Agaricus chloroides* Krombh. t.56/8, 9, — *R. chloroides* Krombh. in Bresadola Icon. t. 402, — *Lact. exsuccus* Otto in Cooke Illustr. t. 981.

Hut schmutzig weiss, Lamellenansatz an der Stielspitze blaugrünlich. Lamellen spröde, oft tränend, fallweise mit weisser scharfer Milch. Laub- und Nadelwald im Sommer und Herbst. Nicht milchende Exemplare findet man alljährlich. Milchende Exemplare sind seltener. Fundstellen von milchenden Formen sind: Schottenwald 1933; bei Purkersdorf 1936; Sparbacher Tiergarten 1940; Scheiblingstein 1953 und 1954. Eine Ausnahme machte das Jahr 1948, wo die milchenden Formen im ganzen Wienerwald sehr häufig gefunden wurden. Nach den Wetterberichten der Zentralanstalt für Meteorologie in Wien war dieses Jahr im Sommer nasskalt, nur teilweise heiter und warm. Ab Mitte August Trockenheit mit nur geringen Niederschlägen und auch etwas kühler als der Durchschnitt früherer Jahre.

Russula glaucophylla stellt durch ihre milchende Form die Verbindung mit den Milchlingen her. Aus diesem Grunde kann man schliessen, dass alle *Russula*-Arten das Stadium der Lactarieen hinter sich haben. Was die Milch anbelangt, so hat sich dieselbe durch die lange Zeit gereinigt, oder ist geronnen, dünnflüssiger, durchsichtiger geworden und ist heute als heller Saft in den ehemaligen Milchkanälen der Täublinge vorhanden. Wie man sieht, gibt es aber auch Rückschläge und unser Pilz stellt einen solchen dar. Die rauhe Hutoberfläche weist auch auf eine tiefstehende Form hin.

2. *R. delica* Fries 1874. — Weisstäubling.

Icon.: Cooke Illustr. t. 1068. — Lange Fl. Ag. Dan. t. 177/C.

Hut weisslich, Lamellen und Stielspitze weiss bleibend. Hut und Stiel glatt. Meist auf nacktem Hochwaldboden im Sommer. Nicht sehr häufig. Am Riederberg 1918; bei Mauer 1930; Neuwaldegg 1934; Rekawinkl 1947; Purkersdorf 1950; in den östlichen Donaubergen nördlich des Marchfeldes 1952; am Riederberg 1953.

Bei *R. delica* zeigt der glatte Hut und Stiel sowie die weiss bleibenden Lamellen einen deutlichen Unterschied an, während *R. glaucophylla* eine rauhe Oberfläche und einen blaugrünen Ton an der Stielspitze zeigt, der sich aber im Exsiccat verliert.

II. *Nigricans*-Gruppe. — Schwärzende Täublinge. — Hut weisslich, bräunlich bis schwarz, Lam. blass bis creme, Stiel weiss bis bräunlich. Fleisch weiss, rot oder schwarz anlaufend, sehr fest.

3. *R. nigricans* Bull. 1780. — Schwärzender Täubling.

Icon.: Bull. Herb. Fr. t. 579, — Gramberg t. 27, — Cooke, Illustr. t. 1015, — Krombh. t. 70/14, 15, — J. Schäff. 1952, t. 1/1.

Hut sepiabräunlich, glatt, Lam. creme, sehr dick, weit auseinanderstehend, spröde, bei Bruch so wie das Fleisch rötlich anlaufend. Mit der Zeit schwärzt der Pilz vollständig und ist im nächsten Frühjahr bis in den Sommer hinein noch in schwarzen, verschrumpften Exemplaren zu finden.

4. *R. densifolia* Secr. 1833, — Engblättriger Täubling.

Icon.: Cooke, Illustr. t. 1017. — Bres. Icon. t. 399. — J. Schäff. Russ. 1952, Tab. 1/2.

Hut weisslich, erst später bräunlich anlaufend, fast schmierig, glatt. Lam. erst weisslich, dann gilbend bis schwärzlich, auf Bruchstellen so wie das elastische Fleisch rötlich anlaufend. Stiel weiss, bald bräunlich werdend. Geschmack bald brennend. In Laubwäldern, besonders unter Eichen stehend, sonst auch im Nadelwald vorkommend. Im Wienerwald nicht gar zu häufig anzutreffen. Salmannsdorf, Häuserl am Rain 1948; im Mischwald bei Mauer 1954.

5. *R. albonigra* Krombh. 1843. — Weisschwarzer Täubling.

Icon.: Krombh. t. 70/16, 17.

Hut, Lam., Stiel in der Jugend weiss, dann aber bräunlich bis schwarz werdend, nur an der Stielspitze lange Zeit weiss bleibend. Wenn dieser Pilz ganz schwarz wird, so ist er nur mehr durch seine schmalen engen Lamellen von *R. nigricans* zu unterscheiden. Auch sein Fleisch wird sehr bald schwarz, ohne vorher zu röten. Im Wienerwald alljährlich. Im Mischwald bei Mauer, Purkersdorf, Irenental, bis Klosterneuburg.

6. *R. adusta* (Pers.) Krombh. 1843. — Sonngebrannter Täubling.

Icon.: Krombh. t. 70/12, 13. — Mich. Schulz, t. 225. — Melzer Atl. t. 3.

Hut gelbbräunlich, bleibt auch im Exsiccat heller als alle seine Verwandten. Lam. blass, fast dicht stehend. Stiel weiss, gelbbräunlich anlaufend, meist kurz. Fleisch weiss, wird schwach rotbräunlich, schliesslich rauchgrau. Geschmack mild bis schärflich. Fundorte: Mauer bei Wien, im Irenental, aber nicht häufig.

7. *R. semicrema* Fries 1874. — Halbverbrannter Täubling.

Icon.: Fr. Icon. sel. t. 172/1, Cooke Illustr. t. 1067.

Hut weisslich bis cremfarbig, anfangs in der Mitte vertieft, hat mitunter die Neigung, sich am Rand mit den Lamellen nach oben einzurollen. Lamellen weiss, im Exsiccat an den Rändern oft fast zitronengelblich bis bräunlich verfärbend. Stiel weiss, ebenso das Fleisch, läuft aber von der Stielbasis grau bis schwärzlich an. Geschmack mild. Im Laubwald am Tulbinger Kogel 28. X. 1952. Wurde auch schon 1928 bei Klosterneuburg sowie bei Rekawinkel im Mischwald gefunden. Sonst sehr selten.

8. *R. elephantina* (Bolt.) Sing. 1932. — Elefantentäubling
Icon.: Bolton 1788, t. 28, — Britzlm. Hym. Augsb., t. 490/36.

Eine der grössten Arten! Hut in der Jugend halbkugelig, hellocker, aber auch dunkelbraun, in der Mitte fast schwarz. Es kommen aber auch verschiedene Übergangsformen vor, die von lichtocker sogar purpurbraun werden können. Der sonst weisse Stiel wird in der Regel von der Basis schön gelbbraun über rotbraun, schwarzbraun. Lamellen weiss, mit dem aufgebogenen Hutrand, schwarzbraun werdend. Man denkt hier unwillkürlich an *R. semicrema,* die aber doch eine andere Haltung besitzt. Besonders charakteristisch ist der dicke Stiel und das Schwärzen der Lamellenränder. Die dünne, fast glänzend schmierige, öfters von Adern durchzogene Hutoberhaut stellt diesen Pilz phylogenetisch schon zu den höher entwickelten Russuleen. Geschmack mild und angenehm. Im Buchenhochwald und Jungwald mit Eichen, im Wienerwald. In den Voralpen kommt er auch in den Mischwäldern vor, so im Wechselgebiet und im Rosaliengebirge bei Lichtenegg, Herbst 1952 bis 1954.

Russula elephantina wurde von J. Bolton in seiner History of Funguses 1788 beschrieben. In der deutschen Übersetzung von Willdenov 1795, pag. 49, wird erwähnt, dass der Hut eine gelbliche Tonfarbe besitzt, erst klebrig ist, dann trocken, von dunkler abwechselnder Farbe und wie verbrannt aussieht. Die Lamellen sind dicklich, zerbrechlich wie Wachs und von einer bleichen, weisslichen Talgfarbe (Kerzenfarbe). Der Strunk ist fest, breit, weich und schwammig, weiss, später schmutzig, dann hart.

E. Fries reiht *R. elephantina* in seinem Werk Hymenomycetes Europaei 1874, p. 440, unter die schwärzenden Täublinge ein.

Cooke beschreibt den Pilz in seinem Handbook of British Fungi 1883, p. 320. Saccardo übernimmt in seiner Sylloge 1887, Vol. V. die Beschreibung von Fries. Britzelmayr hat *R. elephantina* in seinen Hymenomyceten von Augsburg auf Tafel 490, fig. 36, abgebildet.

Singer beschreibt *R. elephantina* in seiner Monogr. der Gattung *Russula,* 1932, p. 363, ausführlich und betrachtet *R. mustelina* Fries als Synonym davon.

III. *Decolorans* - Gruppe. — Graufleischige Täublinge. — Hut rot bis gelb. Lamellen, Stiel und Fleisch grau werdend. Geschmack mild.

9. *R. decolorans* Fr. 1874. — Orangeroter Graustiel-Täubling.
Icon.: Cooke Illustr. t. 1079. — Bresadola Ic. t. 449.

Hut orangerot, im Alter oft nachdunkelnd. Lamellen blass creme. Stiel und Fleisch anfangs weiss, dann grau werdend. Im Hochmoor des Irrssebeckens in Oberösterreich alljährlich. Auf den feuchten Nadelwaldböden des Wienerwaldes selten: Wolkersdorfer Wälder in

Niederösterreich 1930. Bei Krumpendorf in Kärnten 1947, im Moosburgergebiet 1948.

10. *R. Steinbachii* Cern. et Sing. Annal. myc. 1934, p. 457. — Zinnoberroter Graustiel-Täubling.

Icon.: Ein Aquarell aus der Koll. Schirnhofer in der Bot. Abt. des Naturhist. Museums in Wien stellt einen ähnlichen Fund aus der Umgebung von Graz in Steiermark aus dem Jahre 1886 vor.

Hut zinnoberrot, mit einem 2 cm breiten schwarzen Rand, Lam., Stiel und Fleisch weiss, bald grau bis schwarz werdend. Geschmack vorerst mild, dann etwas bitter. Ein einmaliger Fund aus dem Kastner Moor zwischen dem Irrsee und Mondsee in Oberösterreich. Unter Fichten und Sphagnum im September 1933.

11. *R. vinosa* (Lindbl.) Sing. 1928. — Weinroter Graustiel-Täubling.

Icon.: Bresadola Icon. t. 409.

Hut weinrot bis purpur, Mitte auch ausblassend. Lamellen weisslich. Mischwälder in Kärnten bei Moosburg 1947, 1948. In Oberösterreich bei Schallerbach 1940. Im Hochmoor bei Zell am Moos 1934, 1953. An der Grenze zwischen Steiermark und Niederösterreich beim Hallerhaus in 1300 Meter Höhe im Jahre 1949, im Wechselgebiet häufiger. Am Semmering, Kreuzberg 1927. Im Wienerwald von Rekawinkel bis ins Klosterneuburger Revier, fast alljährlich.

Nach dem Bericht von J. Schäffer im Ark. f. Bot. 1939, p. 22, nennt L. Romell *R. vinosa* bis 1900 *R. obscura,* ab 1905 verwendet er den Namen *R. vinosa* Lindbl., 1924 noch einmal beide Namen nebeneinander. Später zog Romell den Namen *R. vinosa* vor. Wir haben uns entschlossen, den Namen *R. vinosa* zu verwenden, da er für diesen Täubling bezeichnender ist.

12. *R. flava* (Rom.) Bres. 1928. — Gelber Moortäubling.

Icon.: Bresadola Icon. t. 450.

Hut messinggelb, Lamellen weisslich bis gelblich, Stiel und Fleisch anfangs weiss, bald grau werdend. Im *Sphagnum* unter Moorbirken des Flachmoores bei Zell am Moos 1934 und 1953, Oberösterreich. Im Rotgraben bei Klosterneuburg-Wien, 1930.

Bei *R. flava* färbt sich das Fleisch grau, während bei *R. claroflava* nach Grove die Verfärbung nur innerhalb der Stielrinde auftritt.

IV. *Xerampelina*-Gruppe. — Braunfleischige Täublinge. — Hut purpur bis braunrot oder grün, Lamellen ockergelb, Fleisch bräunend, Geschmack mild.

13. *R. xerampelina* Schaeff. 1770. — Heringstäubling.

Icon.: J. Schaeff. t. 214. — Lange, Fl. Ag. Dan. t. 190/D.

Hut purpurn bis braunrot, in der Jugend fast kugelig, an dieser Haltung schon kenntlich. Lamellen ockergelb, Stiel weiss, ebenso das

Fleisch. Die Braunverfärbung tritt bald ein, so dass der ganze Pilz nachdunkelt. Laub- und Mischwald, alljährlich; häufig.

Man kann mehrere Formen feststellen:

a) var. *erythropoda* Pelt. in Bull. soc. myc. Fr. 1908, p. 117. — Icon.: Konrad et Maubl. Icon. t. 361.

Hut rauh, purpurrot, Stiel rosarot. Im Nadelwald bei Rekawinkel 1924, Höbersbachgraben bei Gablitz 1947, Mauerbacher Mischwald 1949.

b) var. *graveolens* (Rom.) Britzlm. in Bot. Zentralbl. 1893, p. 17. — Icon.: Britzlm. Hym. Südb. t. 517/116.

Hut violettpurpurn, Geruch intensiv stinkend. Mischwald bei Gablitz 1950.

14. *R. olivascens* (Pers.) Fr. 1874. — Olivfarbiger Täubling. Icon.: Fries Icon. sel. t. 172/2.

Hut olivgelb, öfters mit purpurroter Randzone, meist etwas rauh. Lamellen blass bis zitronengelb. Stiel weiss, oft braunfleckig. Fleisch blassgelb. Im Mischwald meist unter Föhren. Rekawinkel 1924, am Galitzinberg 1937, Purkersdorfer Wald 1938, bei Hadersfeld 1948.

a) *R. xerapelina* (Schaeff.) Fries. var. *olivascens* Sing. in Monogr. Russ. 1932, p. 331. Fleisch sofort braun werdend. Am Hocheck 1954.

b) *R. xerampelina* Schaeff. var. *elaeodes* Bres. in Icon. myc. 1928, p. 420. — Icon.: Bres. t. 420. Hut oliv mit purpurnen Flecken.

Fleisch gelbbräunlich werdend, Geruch unangenehm. Ziemlich selten. Rekawinkel 1924, Pressbaum 1930, Mauerbach 1948, Galitzinberg 1950.

V. *Foetens*-Gruppe. — Gelbbraune Täublinge. — Hut gelbbraun, oft schmierig, Rand meist höckerig gerieft. Lamellen blass, Stiel und Fleisch weisslich, Geschmack meist scharf.

15. *R. Adelae* Cerno. 1951. — Manschettentäubling. — Descr. et Icon. in Sydowia 1951, p. 315.

Hut gelbbraun, oft mit Velumresten. Lamellen weiss bis blassocker, Stiel weissgelblich, manchmal bräunend, mit manschettenartigem Ringschleier. Fleisch weisslich, porös. Am Fichtenhochwaldrande im Hochmoor bei Zell am Moos, Oberösterreich. Anfang September alljährlich. Im Moorgebiet nördlich des Schwarzensees bei Kitzbühel in Tirol auf Moränengrund in 800 Meter Höhe, Okt. 1954, leg. E. Thirring.

R. Adelae ist der erste Fund eines beringten Täublinges in Europa.

Das Vorkommen von Velumresten bei *R. Adelae* und anderen *Russula*-Arten spricht dafür, dass die Vorfahren der heutigen Russulaceen ein Velum besassen. Gelegentlich kommen auch bei anderen *Russula*-Arten Exemplare mit mehr oder weniger deutlichem Velum vor, z. B. bei *Russula Bachii* n. sp.

16. *R. farinipes* (Rom.) ap. Britzlm. 1893. — Mehlstieltäubling.

Icon.: Ark. f. Bot. 1939, t. 1, — Lange Fl. Ag. Dan. t. 186/A, — J. Schäffer, Russulae 1952, t. 13/44.

Hut gelbbraun, am Rand feingerieft. Lamellen weiss bis creme, ebenso der Stiel, Stielspitze weissmehlig bis flockig. Sehr selten. Bei der Gsänger-Hütte 1927. Im Lainzer Tiergarten unter 200-jährigen Buchen im dürren Laub zwischen den Baumwurzeln, am 2. Dezember 1949.

17. *R. foetens* (Pers.) Ricken 1920. — Stinktäubling.

Icon.: Cooke Illustr. t. 1046, — Gramberg t. 28.

Hut gelbbraun, sehr schmierig, Rand stark höckerig gerieft. Lam. creme, sehr spröde, dicklich, Geruch nach Mandelöl. Laub- und Mischwald. Sommer und Herbst, alljährlich.

18. *R. subfoetens* Smith 1891. — Zart geriefter Täubling.

Icon.: Bull. soc. myc. Fr. 1932, t. 48, Pl. 24. — Cooke Illustr. t. 1047 (im Bild zu gelb).

Kleiner, schlanker und dünnfleischiger als *R. foetens*. Hut mehr avellanus-(Saccardo)-ocker, Rand eng und fein gerieft. Für diese Art charakteristisch sind auch die weissen, dichten und dünnen, elastisch weichen Lamellen. Stiel und Fleisch weiss. Unter Birken im Mischwald. Im Wienerwald nicht selten, alljährlich.

19. *R. fellea* Fries 1874. — Ockerfarbiger Täubling.

Icon.: Mich. Schulz. t. 241. (Das grosse Exemplar ausgenommen in der Farbe gut!) Fries Ic. sel. Hym. t. 173/2, J. Schäffer Russ. 1952, t. 14. 48.

Hut meist lichtbraunocker, Rand glatt. Lamellen blass, Stiel bräunlich. Fleisch weiss, sehr scharf. Im Buchenwald des Wienerwaldes sehr häufig. Sommer und Herbst, alljährlich.

20. *R. ochroleuca* (Pers.) Fr. 1874. — Gelbockertäubling.

Icon.: Gramberg, t. 26, Michael-Hennig-J. Schäffer, t. 89, — J. Schäffer, Russ. t. XV/50.

Hut gelbocker, Rand gerieft. Lamellen weiss, blass. Stiel weiss, sich oft grau verfärbend. Im Nadelwald unter Fichten und Tannen häufig. Rekawinkl 1924, im Siedersgraben bei Klosterneuburg 1928, Windisch-Hütte 1933. Am Hirschengartl bei Mauerbach 1938. Dem Höbersbachgraben entlang wurde im Herbst 1944 links im Laubwald *R. fellea,* rechts im Nadelwald truppweise *R. ochroleuca* gefunden.

21. *R. grata* Britzlm. 1899. — Semmelfarbiger Täubling.

Icon.: Britzlm. Hym. Südb. t. 510/92, 520/120.

Hut lichtocker („cremeus" mit „ochroleucus" Saccardo), etwas matt, Rand feinhöckerig lang gerieft. Lamellen weisscreme, schmal, elastisch. Stiel weiss, von der Basis aus gelbbraun anlaufend. Fleisch weiss, etwas gilbend. Geschmack mild. Im Mischwald ziemlich selten. Bei Rekawinkel 1926, im Gütenbachtal bei Kalksburg 1937 u. 1947, Siedersgraben im Gebiet von Weidling-Klosterneuburg 1945.

VI. *Pectinata*-Gruppe. — Graubraune Täublinge. — Hut graubraun, Rand meist gerieft, Lamellen blass, Stiel weiss bis grau anlaufend. Fleisch weiss, Geschmack scharf.

22. *R. pectinata* Fries 1874. — Kammrandiger Täubling.

Icon.: Rich. et Roze, Atl. d. Champ. 1888, t. XL/11, etwas zu dunkel. — Cooke, Illustr. t. 1101, Lamellen zu weit auseinander stehend, sonstige Haltung gut. — Schäffer, Russ. t. XIV/46, nur die lichten Formen.

Hut gelbbraun, sehr stark ausblassend, dann erscheint er fast durchsichtig, feucht schmierig, Rand kammartig gerieft. Lamellen weiss bis schmutzig cremeblass, Stiel und Fleisch ebenso. Im Hochbuchenwald unter Haselnussgebüsch an der Böschung des Steinbachgrabens bei Marbach an der Donau, 1938. In der Lindenau bei Lichtenegg an der Mischwaldböschung, 1942, im Schottenwald an der Quelle in der Schlucht 1944, Mauer bei Wien im Mischwald, 1950.

23. *R. sororia* Fries 1874. — Umbrabrauner Täubling.

Icon.: Fries, Ic. sel. t. 173/1, Cooke, Illustr. t. 1056, 1057. — J. Schäffer, Russ. t. XIV/47 und links oben die Figur 46.

Hut umbrabraun, Rand lang und stark höckerig gerieft. Lamellen schmutzigweiss bis cremegrau. Stiel und Fleisch weiss, wird braungrau fleckig, sehr spröde, porös, mit Käsegeruch. Ein mehr trockener Pilz. Im Eichen- und Föhrenmischwald bei Königstetten 1926, Mauer 1953.

24. *R. consobrina* Fries 1874. — Graubrauner Täubling.

Icon.: Cooke, Illustr. t. 1055. — J. Schäffer Russ. 1952, t. XIV/47 a.

Hut graubraun, schmierig, Rand nicht gerieft. Lamellen weiss, schmutzig gilbend, gegen den Rand ausspitzend. Stiel weiss, graubraun anlaufend, meist kurz. Fleisch weiss, unter der Huthaut graubraun, Geschmack sehr scharf. Hochsommer in einer Tannenwaldinsel umgeben von Rot- und Weissbuchen auf dem Hohenwartberg 333 Meter bei St. Andrä-Wördern a. d. Donau. Im Nadelwald bei Kronstein (Rekawinkel) 1933. Tannenwald im Irenental bei Untertullnerbach 1950.

VII. *Sardonia*-Gruppe. — Gelbblätterige Purpurtäublinge. — Hut blaupurpur bis rotpurpur. Lamellen blassgelb bis gelb. Stiel weiss bis purpurrosa überhaucht. Fleisch weiss bis gilbend. Geschmack sehr scharf.

25. *R. chrysodacryon* Sing. 1923. — Rotpurpurtäubling.

Icon.: Mich. Henn. t. 82, sehr schön! J. Schäffer, Pilze Mitteleuropas III. Teil, t. 62, fig. 3—11, auch gut!

Hut rotpurpurn, in der Jugend öfters kegelig-gebuckelt. Lamellen blassgelb, später chromgelb mit fast rostgelben oder safrangelben Flecken, die durch das Tränen der Lamellen entstehen. Stiel rötlich, von der Basis aus gilbend. Fleisch etwas gilbend. Geruch angenehm. Im Hochsommer bis Spätherbst in Föhrenwäldern, alljährlich. Kron-

stein bei Rekawinkel, Haizawinkel, Troppberg, Heinratsberg und Sandsteingebiet.

26. *R. peracris* Britzlm. 1893. — Pfefferiger Täubling.

Syn.: *R. atropurpurea* Krombh. forma *peracris* Britzlm. in Botan. Zentralblatt, 1893, p. 17.

Icon.: Britzlm. Hymenom. Südbayern t. 514/104.

Hut rotpurpurn, Lamellen creme bis blassocker. Stiel weiss, von der Basis aus rötend. Fleisch weiss bis cremefärbig, anfangs scheinbar mild, wird aber bald scharf und fast unerträglich lange anhaltend. Hauptsächlich in Tannenwäldern. Am Georgenberg bei Purkersdorf, in Rekawinkel. Geht auch über das Kalkgebiet von Mödling bis nach Gaaden.

27. *R. drimea* Cooke 1883. — Blaupurpur-Täubling.

Icon.: Cooke, Illustr. t. 1023.

Hut blaupurpurn bis anilinviolett, fallweise ausblassend. Lamellen zitrongelb, am Rand etwas wellig, nicht tränend, nicht safranfleckig werdend. Der weisse Untergrund des Stieles ist fast vollständig rosapurpurn überhaucht. Auch das weisse Fleisch läuft an den Stielrändern rosa an. Im Fichtenwald des Gschwendgrabens in der Nähe der Finihütte bei Klosterneuburg, 1935. Bei Untersuchung des Fichtenholzes und deren Wurzeln zeigten sich blaue Fluoreszenzerscheinungen. Weitere Funde waren am Troppberg im Fichtenwald von Gablitz. Im Mischwald bei Lichtenegg, N.-Öst. 1950.

Weil E. Fries in seinem Werk Hym. Eur. p. 442 bei *R. sardonia* keine bestimmte Hutfarbe angibt, haben wir uns entschlossen, den Namen *Sardonia* nur als Gruppenbezeichnung anzuführen.

VIII. *Queletii*-Gruppe. — Weissblätterige Purpurtäublinge. — Hut blaupurpur bis rotpurpur. Lamellen weiss. Stiel weiss oder rot bis pupur. Fleisch weiss. Geschmack meist scharf.

28. *R. Quelétii* Fr. 1874. — Queléts Täubling.

Icon.: Cooke Illustr. t. 1028. — Bresadola, Ic. t. 430.

Hut blaupurpurn, oft olivfleckig, feucht, meist schmierig. Lamellen weiss, weich. Stiel rosaviolettlich, Spitze hie und da weisslich, auch schwach oliv getönt. Fleisch weiss, unter der Huthaut dringt dessen Farbe auch durch, sonst wässerig weich, schmutzig anlaufend. Geschmack brennend. Geruch angenehm. Im Sommer und Herbst in den Nadelwäldern alljährlich in Niederösterreich vom westlichen Wienerwald bis in das südliche Kalksteingebiet vorkommend.

29. *R. cavipes* Britzlm. 1899. — Hohlstieliger Täubling.

Icon.: Britzlm. Hym. Südbayern t. 512/98.

Hut blass purpurrosa, Mitte ausblassend, feucht schmierig, Rand nicht gerieft. Lamellen weiss, weich. Stiel weiss, hohl. Fleisch weiss, feucht. Geschmack scharf brennend, ziemlich lange anhaltend. Im Nadel-, aber auch im Mischwald, sehr selten. Rekawinkel 1928, bei Aspang im Hochwechselgebiet, 1930. Bei Königstetten 1940.

30. *R. violascens* Gill. 1878. — Blasser Violett-Täubling.

Icon.: Gill. Champ. France t. 189. — Lange Fl. Ag. Dan. t. 181/D.

Hut weisslich mit violetter oder olivbläulicher Mitte, feucht schmierig, Rand feingerieft. Lamellen, Stiel und Fleisch weiss, feucht, sehr gebrechlich. Geschmack sehr scharf. Laub- und Mischwald, alljährlich im Herbst.

31. *R. fallax* Fries 1874. — Falscher Speitäubling.

Icon.: J. C. Schäffer t. 16, fig. 1—3. Lange Fl. Ag. Dan. t. 180/A.

Hut rosapurpurn, Mitte dunkel oder violettlich, mitunter sehr stark ausbleichend, Rand feingerieft. Lamellen und Stiel weiss, am nächsten Tag gilbend. Fleisch weisslich, feucht, porös. Geschmack scharf. Selten. Festgestellt bei Gaaden 1951, bei Sievering 1953, im Herbst 1954 bei der Dopplerhütte, im Königstettener Gebiet.

32. *R. purpurea* Gill. 1884. — Purpur-Täubling.

Icon.: Cooke Illustr. t. 1022.

Hut blaupurpurn, Rand nicht gerieft. Lamellen weiss, später gilbend. Stiel weiss mit einem rötlichen Anflug. Fleisch weiss, von der Stielbasis aus gilbend, fest. Geschmack mild bis schärflich werdend. Selten, im Nadel- und Mischwald. Bei Mauer 1932, Purkersdorf 1948 und im Rosaliengebirge bei Kirchschlag 1950.

33. *R. atropurpurea* Krombh. 1845. — Schwarzpurpurner Täubling.

Icon.: Krombh. t. 64/5, 6.

Hut rotpurpurn, Mitte oft schwärzlich, schwach schmierig glänzend. Lamellen, Stiel und Fleisch weiss. Geschmack mild bis schärflich. Im Laub- und Nadelwald bis in den Spätherbst, sogar noch im Dezember. Alljährlich.

IX. *Cinnabarina*-Gruppe. — Zinnoberrote Täublinge.

A. Scharfe, gelbblätterige zinnoberrote Täublinge. — Hut zinnoberrot, in der Mitte zuweilen ausbleichend oder dunkler werdend. Lamellen gelbocker.

34. *R. vesternosa* Fries 1874. — Blasigfleischiger Täubling.

Icon.: Bresadola Ic. t. 446.

Hutrand purpurrosa, Mitte ausbleichend. Lamellen gelb. Stiel weiss, Fleisch schmutzig weiss, blasig-porös. Mischwald, Sommer und Herbst. Alljährlich. Rekawinkel 1924, Riederberg 1934, Sophienalpe 1950, 1951 bis 1954 im Mauerwald bei Wien.

35. *R. Schiffneri* Sing. 1929. — Schiffners Täubling.

Icon.: Bull. soc. myc. Fr. 1935 t. LI, Pl. IV.

Hutrand fleischrosa, blass, Mitte ockerbraun, in der Jugend fast halbkugelig, ockerbräunlich. Lamellen gelbocker. Stiel weiss, gilbend, walzig, fast fingerförmig, lang. Fleisch weiss, blass gilbend, fest. Von der Gsängerhütte zur Windischhütte im Buchenwald, August 1933, leg. R. Singer, der auch im Jahre 1928 diesen Pilz im Kaukasus entdeckte.

B. Scharfe, weissblätterige Zinnobertäublinge. — Lamellen weiss, Stiel weiss oder rötlich, Fleisch mehr oder weniger feucht.

36. *R. emetica* (Schäff.) Fries 1874. — Speitäubling.

Icon.: Fries, Sverige svamp. t. 21. — Lange, Fl. Ag. Dan. t. 181/E.

Hut leuchtend rot, feucht schmierig, Rand stark gerieft. Lamellen, Stiel und Fleisch weiss, nur manchmal gilbend. Der ganze Pilz ist weich, wässerig. Im Hochmoorgebiet des Irrsees, des Mondsees in Oberösterreich, in der Umgebung der Kärntner Seen, bei Moosburg, alljährlich. Im Wienerwald sehr selten; wird hier oft mit roten Doppelgängern verwechselt.

37. *R. fragilis* (Pers.) Fries 1874. — Gebrechlicher Täubling.

Icon.: Bresadola Ic. t. 442.

Hut zinnoberrot, feucht schmierig, Rand feingerieft. Lamellen, Stiel und Fleisch weiss. Er ist trotz seiner Feuchtigkeit sehr gebrechlich. Bei alten Baumstümpfen, ja oft auf diesen selbst und dadurch leicht zu erkennen. Schwieriger wird es bei den blauvioletten Formen. Siehe *R. violascens* Gill.

38. *R. sanguinea* (Bull.) Fries 1874. — Blutroter Täubling.

Icon.: Bresadola Ic. t. 408. — Cooke, Illustr. t. 1019.

Hut intensiv blutrot, schmierig, Rand glatt. Lamellen weiss bis schwach cremefärbig. Stiel weiss, zinnoberrot überfasert. Fleisch weiss, unter der Huthaut durch deren Abfärben rötlich. Der Pilz ist trockener als sein Vorgänger, meist gross und kräftig im Stiel, sein Hut hat auch eine gewisse Neigung zum Aufwärtsrollen, wodurch er dann mehr eine Trichterform annimmt.

39. *R. rosacea* (Pers.) Fries, 1874. — Rosentäubling.

Icon.: Cooke, Illustr. t. 1020. — Lange, Fl. Ag. Dan. t. 182/A und B.

Hut zinnoberrot, oft weissfleckig ausblassend. Lamellen weiss, gilbend, im Alter weit auseinander stehend, zum Unterschied von seinem Vorgänger, bei dem die Lamellen enge beisammen stehen. Stiel und Fleisch weiss. Meist in Waldschneisen zwischen Laub- und Nadelwald. Der Pilz ist von mittlerer Grösse.

40. *R. luteotacta* Rea 1922. — Gelbfleckender Täubling.

Icon.: Lange, Fl. Ag. Dan. t. 181/A und A/1.

Hut leuchtend rot. Lamellen und Stiel weiss, auf Druck gelbfleckend, meist erst am nächsten Tag. Fleisch weiss. Im Laubwald, speziell im 30—50jährigen Eichenjungwald. Auf den ersten Blick einer *R. emetica* ähnlich, aber später durch die chromgelben Flecken und das trockene Fleisch leicht kenntlich.

41. *R. Mairei* Sing. 1929. — Scharfer Zinnober-Täubling.

Icon.: Arch. f. Prot. 1929, t. 12/1—3.

Kleiner als *R. lepida*, der diese Art sehr ähnlich ist. Hut jung leuchtend zinnoberrot, später mit gelblich ausbleichender Mitte, die rauh und fast samtig aussieht. Lamellen weiss, sich schwach gelblich oder bräunlich verfärbend. Stiel weiss, Basis etwas gilbend. Fleisch

weiss, färbt von der roten Huthaut etwas ab. Geschmack leicht schärflich. Unter Buchen, alljährlich im Herbst. Erster Fund war im Schottenwald in der Nähe des Kordonwirtshauses, leg. W o n d r a und R. S i n g e r.

42. *R. a t r o r u b e n s* (Quel.) Sing. 1926. — Schwarzroter Täubling.

Icon.: Lange, Fl. Ag. Dan. t. 185 B.

Hut zinnoberrot, Mitte schwarz. Lamellen weiss bis blass creme, schmal. Stiel reinweiss, an Druckstellen braunfleckig werdend, Fleisch weiss, elastisch. Geschmack in den Lamellen scharf, im Stiel mild. Laub- und Mischwald nur stellenweise häufiger, sonst selten. Sommer 1952 häufig im Mauerwald bei Wien und im Michaelerwald, 1953 bei Lichtenegg in Niederösterreich.

43. *R. e x a l b i c a n s* (Secr.) Sing. 1932. — Ausblassender Täubling.

Hut am Rand schwach zinnoberrot bis rosapurpurn, dann gegen die Mitte zu ausblassend, schmutzig elfenbeinfarbig, mitunter olivblass, oft ist der ganze Hut blass und nur stellenweise zeigt er Farbflecken, mit schmieriger dünner Haut. Lamellen weiss, später creme, ziemlich dicht stehend. Stiel weiss. Fleisch weiss, etwas schmutzig anlaufend. Geschmack anfangs mild, später schärflich. Jahrelang von Hr. L. S c h l ö s s e l h u b e r in einer Ligusterhecke unter Birken der Parkanlagen von Steinhof in Wien gefunden, wo dieser Pilz von Juli bis in den Spätsommer in Gruppen aufzutreten pflegt. Kommt in der nächsten Umgebung, auch im Mischwald von Fichten, Föhren, Buchen, Linden und Pappeln vor. Auf Wiesen wurde dieser Pilz 1950 in der Talsohle der Lindenau bei Lichtenegg, Niederösterr., gefunden. Unter Birken, am Bisamberg 1951, scharenweise.

C. Bittere, gelbblätterige Zinnobertäublinge.

44. *R. p s e u d o i n t e g r a* Arn. et. Gor. 1907. — Scharlachroter Täubling.

Icon.: Lange, Fl. Ag. Dan. t. 193/D. — J. Schäffer, Russ. t. XVIII/62.

Hut scharlach-zinnoberrot, Rand glatt, etwas schmierig. Lamellen zuerst blass, dann gelbocker. Stiel weiss, ebenso das Fleisch. Alte, grosse Exemplare dieser schönen Art bekommen am Hutrand eine höckerige Riefung, der dicke Stiel wird hohl und im Exsiccat kommt es vor, dass er braunschwarz anläuft. Fundorte: Unter Buchen, von Kalksburg zur Wienerhütte bei Kaltenleutgeben am 17. August 1944. Im Mischwald bei Mauer, 27. Aug. 1944; in einer Waldschneise im Gras, 4 Stück unter einer Eiche, am Auberg bei Sieghartskirchen, Niederösterr. Im Buchen- und Eichenwald bei Sievering in Wien, 4. Sept. 1944, im Schottenwald 1948, Sittendorf-Heiligenkreuz 1950.

D. Bittere, weissblätterige Zinnober-Täublinge.

45. *R. l e p i d a* (Fries 1874 p. p.) Ricken 1920. — Zinnoberroter Täubling.

Icon.: Bresadola Ic. t. 413. — Mich. Schulz t. 69.

Hut rein zinnoberrot, rauh. Lamellen, Stiel und Fleisch weiss. Fleisch fest, fast hart. Laub- und Nadelwald, häufig alljährlich.

Fries schreibt bei *R. lepida* in seinem Werk Hymenomycetes Europaei 1874, p. 444, über die Hutoberfläche: „impolito sericello rimosove squamoso“ und gibt als Lamellenfarbe weiss an. Das Bild in Fries, Sverige svampar 1862, t. 159, zeigt aber gelbe Lamellen.

Herr Prof. Nathorst-Windahl in Göteborg sandte uns aus Schweden Exsiccate der dortigen *R. lepida*. Es waren Exemplare mit

Fig. 1. Russula Bachii n. sp. — Der den ganzen Hut überziehende Schleier ist an 2 Stellen durch ein zartes, spitz zulaufendes Häutchen mit dem Stiel verbunden.

rauher, rissiger und auch solche mit fast seidiger Hutoberfläche. Ein Exemplar hatte zitrongelbe Lamellen. Die schwedische *R. lepida* ist also mit der Beschreibung nach Fries identisch. Wir haben unsere *R. lepida* schärfer abgegrenzt und die Beschreibung nach Ricken, Vademecum, angenommen.

46. *R. Linnaei* Fries 1874. — Linnés Täubling.

Icon.: Fries, Ic. sel. t. 172/3. — Lange, Fl. Ag. Dan. t. 183/C.

Hut dunkel zinnoberrot mit leichter Purpurtönung, weniger rauh. Lamellen weiss, leicht creme werdend. Stiel weiss, aber meist ganz purpurrosa übertönt, im Alter hohl. Fleisch weiss, porös. Im Buchen-

wald am Tulbinger Kogl, 1941, Au am Kraking 1948, im Mischwald bei Mauer 1951, ziemlich häufig.

47. *R. aurora* Krombh. 1845. — Morgenrot-Täubling.

Icon.: Krombh. t. 66/6 und 7. — Bres. Ic. t. 414.

Hut rosazinnoberrot, fleckweise ausblassend, schmierig, Rand glatt. Lamellen, Stiel und Fleisch weiss. Der ganze Pilz fühlt sich weich an. Laub- und Nadelwald, häufig und alljährlich.

R. aurora wird bei Krombh. in die Gruppe der Täublinge mit scharfem Geschmack eingeteilt. Unsere *R. aurora* ist aber bitter.

R. rosea Quelét, wird als Synonym geführt, soll aber nach der Original-Literatur Haselnussgeschmack haben.

48. **R. Bachii** nov. spec. — Schleiertäubling.

Syn.: *R. aurora* Krombh. forma *velata.*

Pileus colore miniato, hemisphaericus, glutinosus, velo albo pituitoso, e margine pilei 8 cm; lamellae albae, spissae, molles; stipes albus, cylindricus, ca. 6 cm longus, 1,5 cm crassus; caro alba, mollis.

Hut zinnoberrot, mit schleimigem Velum, das vom Hutrand aus zur Stielmitte mit weissen Schleierresten verbunden ist. Hutdurchmesser 8 cm, Lamellen weiss, weich, dicht stehend. Stiel weiss, fast walzig, Länge 6 cm, Stärke 1,5 cm. Fleisch weiss, weich.

Während der Innsbrucker Mykologentagung 1952 wurde bei einer Wanderung im Hochmoorgebiet von Tiersburg am 26. August dieser Pilz von Herrn Dr. Egon B a c h aus Berlin, unter Buchen gefunden und von Herrn Professor Dr. K. L o h w a g aus Wien fotografiert.

E. Milde, gelbblätterige Zinnobertäublinge.

49. *R. R o m e l l i i* (Maire) Bres. 1928. — Gänsefuss-Täubling.

Icon.: Bresadola Ic. t. 447. — Cooke, Illustr. t. 1034.

Hut scharlachrot, Mitte öfters ausblassend, manchmal noch dunkler, etwas schmierig, Rand weit gerieft. Lamellen creme bis ockergelb, mit dem Hutrand gabelig, gänsefussartig verbunden. Stiel reinweiss, wird aber gelbbraunfleckig und ebenso das Fleisch, im Alter fast gesprenkelt. Ist ein guter Speisepilz, aber sehr selten. Im Sommer, Laubwald unter Birken, liebt sonnige Stellen. Am Riederberg 1924 und 1942, Hainbuch zur Dopplerhütte, 1948.

F. Milde, weissblätterige Zinnobertäublinge.

50. *R. p a l u d o s a* Britzlm. 1899. — Scharlachroter Moortäubling.

Icon.: Britzlm. Hym. Südb. t. 501/60. — Lange, Fl. Ag. Dan. t. 193/A.

Hut scharlach-zinnoberrot, in der Jugend lange Zeit halbkugelig. Lamellen weiss, erst nach längerer Zeit sehr schwach bleichcreme werdend, Stiel weiss, teilweise rot überhaucht. Fleisch weiss. Geschmack mild, selten in den Lamellen ein wenig schärflich. In den feuchten Nadelwäldern der Seckauer Alpen, am Zinken in 1000 m Höhe, unter Birken im Juli 1936, bei Knittelfeld, Steiermark. Hochmoorboden bei Zell am Moos in Oberösterreich, 1933, 1953.

X. *Maculata-Aurata*-Gruppe. — Orangerote Täublinge. — Hut gelborange im Grundton, mit ausgebreitet roten Flecken oder ganz rot, Mitte oft ausbleichend und braungefleckt. Lamellen weiss, gelb und aprikosenfärbig. Stiel weiss oder zitronengelb. Fleisch weiss, mild bis schärflich.

51. *R. maculata* (Quel.) Bres. 1928. — Rostfleckiger Täubling.

Icon.: Bres. Ic. t. 417. — J. Schäffer, Russ. 1952, t. XIX/65.

Hut scharlachrot, Mitte ausbleichend, rostbraun gesprenkelt. Lamellen gelbocker bis aprikosenfarbig. Stiel und Fleisch weiss. Geschmack schärflich bis mild. Vorwiegend im Eichenwald, Sommer und Herbst, alljährlich.

52. *R. pseudoaurata* J. Schäffer 1928. — Scharfer Goldtäubling.

Hut orangegelb, glanzlos. Lamellen blass bis orangegelb mit zitrongelber Schneide. Stiel weiss, an der Basis braun werdend. Fleisch weiss. Geschmack im Hut mild, scharf in den Lamellen und im Stiel. Mischwald im Sommer, selten. Bei Gr.-Ebersdorf nördlich vom Marchfeld 1950, im Kreuttal bei Schleinbach 1950, im Schottenwald, Wien, 1950.

53. *R. aurata* (With.) Ricken 1920. — Goldtäubling.

Icon.: Cooke Illustr. t. 1080. — Lange, Fl. Ag. Dan. t. 190/C. — Krapf, 1. Heft, t. V./1—8. — J. Schäffer, Russ. t. XI./37.

Hut gelborange, rotfleckig oder ganz rot. Lamellen blasscreme mit zitrongelber Schneide. Stiel weiss, auch gelb. Fleisch weiss, mild. Im Mischwald, vereinzelt oder in kleinen Gruppen, alljährlich. Im Jahre 1930 haben wir in einer Inselgruppe von Haselnuss mitten im Mischwald der Donauberge, nördlich vom Bisamberg, 104 Stück der *R. aurata* gefunden. Es kommen alle möglichen Übergänge von *R. aurata* über *R. pseudoaurata* zu *R. maculata* vor.

Die folgende Art, *R. maculata,* bildet den Übergang zu den purpurfleckigen Täublingen.

54. *R. maculata* (Quel.) Cooke 1883. — Robuster Täubling.

Icon.: Cooke, Illustr. t. 1069.

Hut lichtocker im Untergrundton, oben grössere Purpurflecken, in der Mitte mit Rost- oder Orangefärbungen. Es kommen aber auch ganz blasse Formen vor, die von einem kräftigen Purpurrand umsäumt sind. Bei diesen lichten Exemplaren, die schon einen gewissen Übergang zu Bresadola's *maculata* bilden, zeigen sich blasse Punkte, die rot eingesäumt sind, so ähnlich, wie sie bei den Saugstellen der San José-Schildlaus an Apfel oder Birne sich zeigen, wo das Anthocyan aufgesogen wurde. Die Lamellen sind in der Jugend fast weiss, werden aber sehr bald gelb und werden im Alter aprikosenfarbig. Der weisse Stiel wird von der Basis aus blass bis dunkel rostbraun fleckig, ja mitunter tauchen sogar schwarze Punkte auf. Das zuerst weisse Fleisch ist hart, wird später weich und fleckig,

auch der Stiel ist wie mit Watte ausgestopft, nur die Stielrinde bleibt hart. In dem weicheren Zustand nähert sich dieser Pilz schon der *Nauseosa*-Gruppe. In dem kälteren baltischen Florengebiet des Wienerwaldes ist die weichere Form zuhause, während östlich von Wien, in der wärmeren, pannonischen Zone, die sich weit über das Marchfeldgebiet erstreckt, die härteren Formen zu finden sind. In den Buchenwäldern des Wienerwaldes, Sommer und Herbst, so bei der Windischhütte 1930, am Dreimarkstein 1933. In den Eichenwäldern der Ostzone, wo auch Föhren eingestreut sind, wie bei Schleinbach im Kreuttal 1950 und 1953.

XI. *Nauseosa* - Gruppe. — Braunpurpur Täubling. — Hut hell fleischfarbig bis bräunlichpurpur. Lamellen blassocker bis gelbocker. Stiel weiss, weich, manchesmal oft so, dass man ihn über den Finger wickeln kann, bisweilen aber auch fest und dick. Fleisch weiss, läuft öfters braungrau an. Geschmack meist mild.

55. *R. nauseosa* (Pers.) Ricken 1920. — Ekeliger Täubling.

Icon.: Bres. Ic. t. 469, — Cooke, Illustr. t. 1147. — Lange, Fl. Ag. Dan. t. 195, C. D. — J. Schäff. Russ. t. XII./39.

Hut fleischrot bis purpurbraun, Mitte auch ausblassend, olivfleckig, schmierig, Rand feinhöckerig gerieft. Lamellen gelbocker. Stiel weiss, wird manchmal im Alter grau. Fleisch weiss, zellig hohl.Im Wienerwald Sommer und Herbst. In Winden bei Rekawinkel am 2. November 1952, standen Exemplare mit 17 cm Hutdurchmesser, die Stiele mit 13 cm Länge und 3 cm Dicke. Buchen- und Föhrenmischwald. — Es gibt verschiedene Spielarten, siehe Singer, Monogr. Russ. 1932, p. 263.

XII. *Puellaris* - Gruppe. — Gilbendstielige Täublinge. — Hut purpuroliv, bisweilen mit ausblassender, zuweilen mit dunkler Mitte braungelblich, in der Farbe stark variierend. Lamellen blass bis gelb. Stiel weiss, von der Basis aus gilbend, weich, ebenso das Fleisch. Geschmack mild bis scharf.

56. *R. puellaris* Fries 1874. — Gilbender Täubling.

Icon.: Ricken, Blätterpilze, 1915, t. 17/2. — Mich. Schulz, t. 237. — Cooke, Illustr. t. 1065, 1066. — Bres. Ic. t. 454. — J. Schäffer, Russ. t. VI./22. — Lange, Fl. Ag. Dan. t. 184/A.

Hut hell oder schmutzig braunpurpur, oft mit einer dunkleren Mitte, Rand gerieft. Lamellen cremeocker bis gelbocker. Stiel weiss, von der Basis aus gelblich werdend. Stielspitze hie und da bereift. Geschmack mild bis scharf. Sommer und Herbst im Laub- und Nadelwald, häufig. Alljährlich.

57. *R. versicolor* J. Schäffer. 1931. — Lascher Täubling.

Icon.: J. Schäff. Russ. 1952, t. VIII./23.

Hut violettpurpurn mit blasser, meist aber mit schwärzlicher Mitte, auch rosa bis fleischrot wechselfarbig, Rand schwach gerieft. Lamellen schön creme- bis buttergelb, stellenweise ocker angelaufen.

Stiel weiss, über Nacht fast orange gilbend, seidig glänzend, nicht bereift, jung voll, später schwammig weich. Fleisch weiss, langsam aber nicht immer gilbend. Geschmack im Stiel meist mild, in den Blättern schärflich. Mischwald unter Birken im Irenental, Okt. 1952.

XIII. *Alutacea-Integra*-Gruppe. — Ledertäublinge. — Hut rotbraun, purpurbraun oder olivbraun. Lamellen gelb bis gelbocker. Stiel weiss bis rosa. Fleisch weiss bis gilbend. Geschmack meist mild.

58. *R. alutacea* (Pers.) Fries 1874. — Ockerblätteriger Täubling.

Icon.: Gramberg t. 22, grosse Fig. — J. Schäff. Russ. t. X/35.

Hut ledergelb bis purpurn, schmierig, glänzend, Rand höckerig gerieft. Lamellen ledergelb bis satt ockergelb, zuweilen mit roter Schneide. Stiel weiss, mitunter rosapurpurlich angehaucht, keulig, walzig, auch bauchig aufgeblasen. Fleisch weiss, fest, im Alter weich werdend. Geschmack mild, angenehm. Laub- und Nadelwald, Sommer und Herbst, in Gruppen, aber nicht allzu häufig. Am Riederberg 1918, bei Rekawinkel 1924, Nadelwälder auf der Holzwiese bei Schallerbach 1940, im Buchen- und Eichenwald des südlichen Lainzer Tiergartens 1950.

59. *R. curtipes* Möll. et Schäff. 1935. — Kurzstieliger Täubling.

Icon.: J. Schäffer, Russ. 1952, t. XI/35 a.

Hut weinrot bis dunkelkarmin mit gelbbraunem Unterton, speziell dort, wo er schuppig aufgebrochen ist, sonst feucht schmierig; wenn eine glatte Hutoberfläche vorhanden ist, so bilden die Farben grössere Flecken mit blasser Mitte, nur im Alter kurz gerieft. Lamellen licht- bis dunkel gelbocker, stark gabelig, ja oft teilweise löcherig verbunden. Stiel weiss, mit einem schwachen Anflug von gelb, kurz und hart. Fleisch weiss, etwas gilbend. Geschmack mild, angenehm. Im Fichtenstangenwald des Rittsteiges bei Rekawinkel, Aug. 1924, Niederösterr., im Buchenwald westlich von Schallerbach, Oberösterreich, 1940, Rekawinkel 1943.

Russula curtipes ist ein sehr hartfleischiger Täubling, härter noch als *R. lepida*. Auf dem Bild in Bull. soc. myc. Fr. 1935, t. LI. Pl. V. ist Fig. 5 *R. curtipes*, während die Figuren 1—4 eine langstielige Form darstellen, die noch dazu ein weiches Fleisch besitzt. Wir haben uns daher entschlossen, dieselbe als *Russula languida*, nov. spec., aufzustellen und sie von *R. curtipes* abzutrennen.

60. **R. languida** nov. spec. — Matter Täubling.

Icon.: Bull. soc. myc. Fr. 1935, t. 51, Pl. V. fig. 1—4.

Pileus colore inter purpureum et subcarmineum variabili, sine nitore, in centro pallescens. Forma pilei primo pulvinaris modo convexa, postea in planum se extendens, in centro depressa, diam. usque ad 20 cm. Lamellae flavo-ochraceae inter se pari fere longitudine,

modice distantes, latae. Stipes albus, usque ad 10 cm longus, infima parte in clavae modum ad 3 cm tumescente. Caro alba, mollis, in stipite farcta. Sapor mitis. Spores ochracei.

Hutfarbe purpurn bis hellkarmin, matt, Mitte ausbleichend. Hut anfangs polsterig gewölbt, dann ausflachend, Mitte eingedrückt, Durchmesser bis 20 cm, Lamellen gelbocker, meist gleichlang, mässig entfernt, breit, Stiel weiss, bis 10 cm lang, an der Basis bis 3 cm dick. Fleisch weiss, weich, im Stiel ausgestopft, Geschmack mild, Sporen ocker. Im Mischwald mit Lärchen bei St. Marein nördlich von Schallerbach, Sept. 1946. Am Dornberg bei Rekawinkel 1948.

61. *R. olivacea* (Pers.) Ricken 1920. — Rosastieliger Ledertäubling.

Icon.: J. Chr. Schaeffer 1762, t. 204, Krombh. t. 68/13, 14. — Jul. Schäffer, Pilze Mitteleuropas III. Teil, t. 35.

Hut braunpurpurn bis oliv, matt, rauh. Lamellen gelbocker. Stiel weiss, meist rosa gesprenkelt. Fleisch weiss, etwas gilbend mit angenehmem Nussgeschmack. In den Buchenwäldern des Wienerwaldes im Hochsommer massenhaft anzutreffen. Dieser Pilz kommt auch in Nadelwäldern vor. Wir haben ihn in allen Bundesländern Österreichs gefunden.

62. **R. Schoeffeli** *), nov. spec. — Rotstieliger Buckeltäubling.

Syn.: *R. roseipes* Secr. var. Cooke t. 1081.

Pileus colore inter rubro-purpureum et carmineum variabilis superficie hirta, centro saepe gibboso, nonnumquam in planum se extendens, margine haud striato, usque ad 7 cm diam. Lamellae flavae vel luteae, satis distantes ca. pari longitudine, a stipite saepe intervallo disiunctae, elasticae. Stipes albus, a basi rubro-maculatus, procerus, basim versus attenuatus, usque ad 7 cm longus, ad 1 cm crassus. Caro alba, mollis, porosa. Sapor mitis. Sporarum pulvis flavus, Sporae globoso-ellipticae, verrucosae, 7—10 ⇌ 6—7 μ.

Hut rotpurpurn bis karmin variierend, rauh, Mitte gebuckelt, Rand nicht gerieft, Durchmesser bis 7 cm, Lamellen gelb bis dotterfarbig, entfernt stehend, meist von der Stielspitze abgesetzt, elastisch, Stiel weiss, von der Basis aus rot geflammt, gegen die Basis verdünnt, bis 7 cm lang und 1 cm dick, Fleisch weiss, weich porös, Geschmack mild, Sporenstaub gelb, Sporen fast kugelig bis elliptisch, warzig, 7—10 ⇌ 6—7 μ.

Im Laubwald, ziemlich selten, im Frühsommer. Bei St. Veit a. d. Triesting 1931, Anninger bei Mödling 1941, am Auberg bei Sieghartskirchen 1944, im Ellenderwald 1954, alles in Niederösterreich.

Wir konnten unseren Pilz mit dem Bild von *R. roseipes* Secr. in Cooke's Illustr. t. 1081 identifizieren. Die Beschreibung

*) J. Schoeffel zu Ehren benannt, der Bürgermeister von Mödling bei Wien gewesen ist.

nach Secretan und nach Cooke stimmt aber mit unserem Pilz nicht überein. Wir sahen uns daher veranlasst, diesem Täubling einen neuen Namen zu geben.

63. *R. integra* (Linné) Fries 1874. — Schmieriger Täubling.

Icon.: Bresadola Ic. t. 451. — J. Schäffer, Pilze Mitteleurop. III. Teil, t. 68. — Lange, Fl. Ag. Dan. t. 196/F. — Mich. Schulz, t. 238.

Hut licht und dunkelpurpurn, braunrot bis oliv, schmierig, Rand in der Jugend glatt, später höckerig gerieft. Lamellen blassgelb bis blassocker. Stiel weiss, fast seidig. Fleisch weiss, wird im Stiel weich. Geschmack mild. Im Fichtenwald alljährlich. Am Heuberg in Wien, Zigeunersteig am Speichberg bei Purkersdorf, Pressbaum, Rekawinkel etc. in Niederösterreich, bei Eisenstadt im Leithagebirge, Burgenland; vom Windhag bis Festenburg in Steiermark, Krumpendorferwald am Wörthersee in Kärnten, Umgebung von Linz, Vöcklabruck und im Irrseebecken Oberösterr., in den Fichtenwäldern bei Goldegg, Torrener Joch, im Salzburgerischen Gebiet. Auch im Waldviertel von Niederösterreich.

64. *R. nitida* (Pers.) Fries 1874. — Glänzender Täubling.

Icon.: J. Schäffer, Russ. t. X./33.

Hut schwarzpurpurn, öfters auch braunpurpurn, glänzend, Rand meist höckerig gerieft. Lamellen schön gelbocker. Stiel weiss, etwas bräunlich anlaufend. Fleisch weiss. Geschmack scharf, wird zuweilen auch bitterlich. Meist im Nadelwald, Sommer und Herbst, nicht zu häufig. Bei Rekawinkel 1924, Pressbaum 1928, am Kahlenberg 1933, bei der Gsängerhütte 1933, im Irenental 1950, Mischwald bei Mauer 1952.

XIV. *Chamaeleontina*-Gruppe. — Chamaeleontäublinge. — Hut rot bis gelbrot, Lamellen gelbocker, Stiel weiss, Fleisch weiss.

65. *R. chamaeleontina* Fries, 1874. — Chamaeleon-Täubling.

Icon.: Bresadola Ic. t. 470.

Hut rosapurpurn mit gelber Mitte. Lamellen gelbocker. Stiel weiss. Fleisch weiss. Geschmack mild. der ganze Pilz ist so elastisch, dass man ihn in der Hand zusammenpressen kann, beim Öffnen der Handfläche quillt er fast ganz wieder auf. Im Laubwald, Sommer und Herbst, alljährlich.

66. *R. aurantiolutea* (Kauffm.) Bres. 1928. — Scharfer Chamaeleon-Täubling.

Icon.: Bresadola Ic. t. 439.

Hut gelb mit orangeroten Zonenflecken getönt, schmierig, im Alter am Rande gerieft. Lamellen von lichtgelb bis ockergelb. Stiel weiss. Fleisch weiss, unter der Huthaut gelblich. Geschmack scharf. Im Nadelwald besonders unter Föhren. Im Hochsommer, selten. Am Riederberg 1930, Kronstein bei Rekawinkel 1939, in der Nähe der

Windischhütte 1948, von Hainbuch zur Dopplerhütte 1949. Im Mauer-Mischwald 1952.

XV. *Lutea*-Gruppe. — Gelbe Täublinge.

67. *R. lutea* (Huds.) Ricken 1920. — Gelber Täubling.

Icon.: Cooke, Illustr. t. 1082, Mich. Schulz, t. 240.

Hut gelb, Rand glatt. Lamellen anfangs hell, dann ockergelb. Stiel weiss, ebenso das Fleisch. Geschmack mild. Der ganze Pilz ist sehr gebrechlich. Im Buchenwald, Sommer und Herbst, nicht so häufig. Hochramalpe bei Purkersdorf, 1943.

68. *R. ochracea* (Pers.) Fries, 1874. — Weicher Gelbtäubling.

Icon.: Krombh. t. 68/9, 10.

Hut gelb, weich, Rand stark höckerig gerieft. Lamellen gelb. Stiel weiss, leicht gilbend. Fleisch weiss und weich. Geschmack mild. Nadelwald, selten. Bei Rekawinkel 1924, am Riederberg 1944, Tullnerbach 1953.

69. *R. solaris* Ferd. et Winge 1928. — Sonnentäubling.

Icon.: Bull. soc. myc. Fr. 1943, t. 59.

Hut gelb mit orangeroter Mitte, später bräunlich, Rand fein gerieft. Lamellen blass bis creme. Stiel weiss, braunfleckig werdend. Fleisch weiss, im Alter etwas bräunlich anlaufend. Geschmack scharf. Im Buchenwald, selten. Bei Rekawinkel 1945, Windischhütte 1948, Hadersfelder Höhe 1948, in der Lindenau bei Lichtenegg, Niederösterr., 1954.

70. *R. citrina* Gill. 1881. — Hartfleischiger Täubling.

Icon.: Gill. Champ. Fr. t. 187.

Hut zitronengelb, glatt. Lamellen, Stiel und Fleisch weiss, später etwas braunfleckig werdend. Fleisch hart. Geschmack mild bis leicht schärflich. Mischwald, selten. Am Riederberg 1927, bei Mauerbach 1948.

71. *R. violeipes* Quel. 1897. — Violettfleckiger Täubling.

Icon.: Bull. soc. myc. Fr. 1931, t. 9, 10. — Lange, Fl. Ag. t. 188/D.

Hut jung gelb, später violettfleckig. Lamellen weiss bis gelblich. Stiel weiss, wird oft ganz violettfleckig. Fleisch weiss. Geschmack mild. Nadel- und Mischwald, im Sommer und Herbst, seltener. Am Pfalzberg 1942, bei Mauerbach 1944, am Troppberg und bei Hadersfeld 1948, Hainbuch 1950.

R. violeipes Quel. wird in der Literatur als Synonym für *R. amoena* Quel. angeführt. Romagnesi wendet sich in Bull. soc. myc. Fr. 1942, p. 160, gegen die Identifizierung der beiden Täublinge. Das Bild, das Melzer und Zvara l. c. 1931, t. 9 und 10, als *R. amoena* Quel. veröffentlicht haben, ist nach Romagnesi *R. violeipes* Quel.

XVI. *Amethystina*-Gruppe. — Violette Täublinge. — Hut violettlich, blau- bis braunrötlich. Lamellen weisslich bis gelb. Stiel und Fleisch weiss. Geschmack mild.

72. *R. amethystina* Quel. 1897. — Amethyst-Täubling.

Icon.: J. Schäffer, Russ. t. XIII./42. — Mich. Henn. t. 73?

Hut amethystviolett, manchmal gelbfleckig, speziell dort, wo ein abgefallenes Blatt oder Zweiglein als Wachstumshindernis aufliegt, zeigt sich dann ein hellerer Fleck; Rand glatt. Lamellen gelbocker. Stiel und Fleisch weiss, später mit schwach schmutzig gelbem Anflug, wo dann auch am Hutrand eine kurze Riefung auftreten kann. Der ganze Pilz ist weich, biegsam. Im Nadelmischwald bei Mauer 1944, Reisenberg bei Rekawinkel 1948, Au am Kraking 30. Juli 1950.

73. *R. caerulea* (Pers.) Cooke 1883. — Weisstieliger Buckel-Täubling.

Icon.: Cooke, Illustr. t. 1052. — Mich. Schulz t. 236. — Lange, Fl. Ag. t. 194/D. — J. Schäffer, Russ. t. XII/40.

Hut braunrot bis violettlich, Mitte mit Buckel. Lamellen gelb. Stiel und Fleisch weiss. Mischwald, nicht zu häufig. Finsterleitenberg bei Rekawinkel 1938, am Riederberg und bei Mauer 1950.

74. *R. punctata* Krombh. 1845. — Punktierter Täubling.

Icon.: Bres., Ic. t. 463 (als *R. Turci* Bres.).

Hut lilapurpurn, blauviolett, auch oliv mit rosabräunlichem Rand, mit filzigen Punkten übersät. Lamellen creme-gelblich. Stiel und Fleisch weiss. Im Mischwald, meist in verschiedenen Farbschattierungen beisammenstehend. In der Literatur wird obiger Name auch für andere Täublinge gebraucht, bei denn man auch mit der Lupe keine Punkte finden kann. Im Sommer, nicht zu häufig, aber standortstreu. Wiederholt gefunden am Riederberg ab 1939, Rekawinkel 1940, im Mauerwald 1950, Pressbaum 1953.

75. *R. azurea* Bres. 1928. — Bereifter Täubling.

Icon.: Bres., Ic. t. 410. — J. Schäffer, Russ. 1952, t. V./19.

Hut blaulila, graublau, weiss bereift. Lamellen, Stiel und Fleisch weiss. Geschmack mild. Nadelwald, selten. Bei Rekawinkel 1936, Schottenwald 1940, Riederberg 1942, Höbersbachgraben bei Gablitz 1948, Mauer 1952.

XVII. *Viridis*-Gruppe. — Grüne Täublinge. — Hut grün, Lamellen weiss bis gelb, Stiel und Fleisch weiss, Geschmack mild.

76. *R. mollis* Quel. 1888. — Weicher Grüntäubling.

Icon.: Bres., Ic. t. 464. — Lange, Fl. Ag. t. 196/G.

Hut gelbgrün, Lamellen ockergelb. Stiel und Fleisch weiss, schwammig weich. Geruch angenehm, süsslich für manche Nasen, unangenehm wieder für andere. Im Mischwald, selten, im Sommer. Stiftswald über Haschhof von Klosterneuburg 1936, Troppberg 1939, Martinsberg am Tulbinger Kogel 1950.

77. *R. aeruginea* (Lindbl.) Fries, 1874. — Lauchgrüner Täubling.

Icon.: Fries, Ic. sel. t. 173/3.

Hut lauchgrün, leicht schmierig, Rand grob gerieft. Lamellen cremegelb werdend. Stiel und Fleisch weiss. Geschmack mild. Sommer im Laubwald, nicht zu häufig. Am Kahlenberg 1933, Dreimarkstein 1933, Au am Kraking 1936, am Fasanberg westlich von Schallerbach, Ober-Österreich, 1940.

78. *R. graminicolor* Secr. 1833. — Grasgrüner Täubling.

Icon.: Gramberg t. 25. — J. Schäffer, Russ. t. IV./15.

Hut gelbgrün, leicht schmierig, Rand nicht gerieft. Lamellen weiss bis blasscreme. Stiel und Fleisch weiss. Geschmack mild bis etwas schärflich. Die schärflichen Arten stehen gern im Nadelwald, Mauerbachwälder bis Hainbuch, 1949—1954, beim weissen Kreuz am Rabenstein, 1953, Ellenderwald nach Göttlesbrunn 1953.

79. *R. virescens* Schaeff. 1762. — Grünschuppiger Täubling.

Icon.: Gramberg, t. 24, Mich.-Henn. 1939, t. 68, Cernohorsky-Machura, Pilzfibel 1946, t. 11, J. Schäffer, Russ. t. III./12.

Hut hell oder dunkelgrün schuppig, mit blasserem Untergrund, manchesmal feinkörnig spangrün, warzig, felderig aufbrechend, Lamellen, Stiel und Fleisch weiss, Fleisch fest, hart, mit Nussgeschmack. Im Birkenwald sehr häufig. Alljährlich und im ganzen Land zu finden.

80. **R. argyracea** nov. spec. — Silbergrauer Täubling.

Pileus colore pallido, in margine subcarnosus, media parte subolivaceus vel pallide carneus, plerumque nitore argenteo canescens, postea in planum se extendens, media parte plerumque depressa, plus minus subtilissime pilosus, margine saepe paululum granuloso vel in segmenta discisso, fere mucosus, dum umidus, in sicco aridus, argenteo colore nitens, margine glabro, aetate provectus saepe modice striatus, usque ad 10 cm diam. Lamellae primo albae, postea subcremeae, plerumque utrinque acuminatae, postea saepe fulvostriolatae vel maculatae, subangustae. Stipes primo albus, postea maculis fulvis conspersus, plerumque ad basim attenuatus modice sericeo nitore, usque ad 8 cm longus, ad 2 cm crassus. Caro alba, subhumida satis solida, mollior in interiore stipite, sapore miti et grato.

Hut blass, am Rande mit fleischfarbigem Stich, in der Mitte etwas oliv getönt, auch blass fleischfarbig, im allgemeinen mit silbergrauem Schimmer, Mitte mehr oder weniger filzig, am Rande etwas körnig bis felderig aufbrechend, feucht schmierig, trocken silberig glänzend, Rand im Alter schwach gerieft. Lamellen jung weiss, später blasscreme werdend, meist beiderseits ausspitzend, mit der Zeit braun gesprenkelt, mehr oder weniger schmal, mässig dicht stehend. Stiel weiss, braunfleckig werdend, meist gegen die Basis verjüngt, schwach seidig schimmernd, bis 8 cm lang, bis 2 cm dick. Fleisch weiss, etwas feucht, ziemlich fest, im Stielinnern etwas weich. Geschmack mild, angenehm. In Eichenmischwäldern mit Föhren, Zitterpappeln und

Haselnuss, in den Bergen nördlich des Bisamberges bis ins Kreuttal, im Sommer 1951, 1953, Mauer, Mischwald, 1954.

81. *R. serotina* Quel. 1878. — Zwergtäubling.

Icon.: Cooke, Illustr. t. 1042.

Klein, Hutdurchmesser 2—3 cm, Hut olivgrün, am Rande etwas purpurlich, Lamellen blass, Stiel und Fleisch weiss. Geschmack etwas schärflich. Sehr selten. Waldwiesenrand mit Eichen und Buchen am Rabenstein im Oktober 1950, leg. Frau V. Zelber, am Glockenberg bei Würnitz im Birkenmischwald, Juni 1952.

Ein kleiner schlankstieliger Täubling, der im Gras schwer zu sehen ist. Nach dem Autor soll er auch auf Baumstümpfen vorkommen!

82. *R. heterophylla* Fries 1874. — Dünnblätteriger Täubling.

Icon.: Bres., Ic. t. 425.

Hut gelbgrün bis blassgrün, gegen den Rand meist dünnfleischig, der umgebogene Hutrand ist nur kurz gerieft, so dass man von oben keine Riefung erblickt. Erst wenn man den Pilz seitwärts dreht und den Rand aufrollt, sieht man die kurze Riefung. Lamellen, Stiel und Fleisch weiss. In Laubwäldern und deren Wiesenrändern, wo er, dann ganz ausgebleicht, zu sein pflegt.

83. **R. brunneomarginata** nov. spec. — Braunrandiger Täubling.

Icon.: J. Schäffer, Russ. t. II./8. (Als *R. heterophylla* Fr.).

Pileus colore viridulo vel luteo-olivaceo, in centro plerumque cremeus vel ochraceo-fulvus maculis conspersus, marginem versus pallescens, in planum se extendens, media parte plerumque depressa et venis rugosa, marginem versus fere glaber, postea breviter jugatus, denique subfulvus vel nigrecans, aquatice pellucidus, usque ad 12 cm diam. Lamellae albae vel subcremeae, satis spissae, saepe valde furcatae, tenues, plerumque ventricosae, subangustae, postea in acie brunneo-maculosae, denique plus minusve fuscescentes. Stipes cylindraceus vel basim versus attenuatus, satis solidus, postea brunneo maculatus, usque ad 8 cm longus, ad 2 cm crassus. Caro alba, persecta paulum brunnescens, porosa, sapore miti. Sporae hyalinae, ellipticae, verrucosae, 7—10 ⇌ 6—7 μ.

Hut grasgrün bis gelbolivgrün, Mitte meist creme bis braunockerfleckig, ausbleichend, aderig runzelig, gegen den Rand glatt, im Alter oft kurz gerieft, Hutrand mit der Zeit bräunlich bis schwärzlich. Durchmesser bis 12 cm. Lamellen weiss bis schwach creme, ziemlich dicht, oft stark gegabelt, dünn, bauchig, schmal, am nächsten Tage an der Schneide braunfleckig, schliesslich mehr oder weniger braun werdend. Stiel meist walzig, bisweilen nach unten oder nach oben verjüngt, ziemlich fest, braunfleckig werdend, bis 8 cm lang, bis 2 cm dick. Fleisch weiss, auf Schnittflächen leicht bräunend, elastisch, porös. Geschmack mild, Sporen weiss, breit elliptisch, eiförmig, Mem-

bran mit stumpfen, durch Leisten verbundenen Warzen, manche mit kleinen Öltropfen, Sporengrösse 7—10 ⇌ 6—7 μ.

Im ziemlich feuchten Mischwald von Buchen, Eichen und einzelnen Fichten des Wurzbachtales bei Weidlingau-Hadersdorf, Juli 1952—1954, auf Seichtwasserkreide mit angrenzenden Schichten von Laaber Schiefer, Mergel und Sandstein.

R. brunneomarginata ist eine Zwischenform von *R. heterophylla* Fr. und *R. furcata* Gmel.

84. **R. subtomentosa** nov. spec. — Feinfilziger Täubling.

Pileus flavo-viridis, centrum versus colore nucis avellanae vel badio, media parte hirtus, pilosus vel velutinus, marginem versus glabrior, postea saepe modice striatus, denique planus, media parte saepe depressa, usque ad 12 cm diam. Lamellae cremeae vel subcitrinae, saepe tenues, utraque plus minusve attenuatae et acuminatae. Stipes basim versus attenuatus, albus, elasticus, usque ad 10 cm longus, ad 2 cm crassus. Caro alba, mollis, saepe brunneo-maculans. Sapor mitis, sporae hyalinae, globosae ellipticae, laxe verrucosae, 6—7 μ diam.

Hut gelbgrün, gegen die Mitte haselnussbraun, dunkelbraun, Mitte rauh, filzig bis samtig, gegen den Rand glatt, im Alter gerieft, flach, in der Mitte eingedrückt. Durchmesser bis 12 cm. Lamellen creme bis hellzitrongelb, dicht, fast dünn, meist beiderseits ausspitzend. Stiel gegen die Basis verjüngt, weiss, ausgestopft, bis 8 cm lang, 2 cm dick. Lamellenschneide und Stiel oft braungefleckt. Fleisch weiss, weich, wird auch öfters braunfleckig. Geschmack mild. Sporen weiss, kugelig-elliptisch, locker, grobwarzig, 6—7 μ.

Mischwald von Eichen, Birken, Zitterpappeln, Föhren mit Haselnusssträuchern, Sommer 1952 und 1954, in den Donaubergen in Gesellschaft von *R. virescens, R. vesca* und *R. maculata.* Auch 1953 wurden im Wienerwald bei Mauer, Steinriegl und in Purkersdorf, Standorte dieses schönen Pilzes festgestellt. In der Farbe ist er dem Bilde von *R. ochroviridis* bei Cooke, tab. 1100, ähnlich; diese hat aber eine mehr glatte Hutoberfläche, grau werdenden Stiel und grau verfärbendes Fleisch.

85. *R. ochroviridis* Cooke, 1883. — Gelbgrüner Täubling.

Icon.: Cooke, Illustr. t. 1100.

Hutrand gelbocker, in der Mitte dunkler olivgrünlich, Hutoberfläche etwas glänzend, schmierig, trocken, glatt. Lamellen weiss, schwach creme scheinend. Stiel und Fleisch weiss, gelbgrau anlaufend, weich, Geschmack mild. Mischwald von Buchen, Eichen, Edelkastanien unter Föhren im Gras am Eichberg bei Königstetten im Juli 1943. Im Mischwald bei Mauer im August 1951. Selten.

86. *R. furcata* (Gmel.) Schwalb, 1891. — Gabeltäubling.

Icon.: Rich. et Roze, Atlas Champ. t. 41/1 u. 2 (typisch). — Krombh. t. 69/20. — Bresadola, Ic. t. 404.

Hut olivgrün, Mitte ausblassend, zuweilen auch dunkler werdend, Hutoberfläche etwas glänzend, schmierig, von der Mitte aus über $^3/_4$ der Fläche aderig runzelig, das letzte Viertel gegen den Hutrand glatt. Lamellen weiss, wiederholt gabelig geteilt, ja oft einen höckerigen, nasenförmigen Aufwuchs zeigend, etwas starr. Stiel weiss, etwas seidig glänzend, oft kräftig, meist walzig, fest. Fleisch weiss, ziemlich fest, im Alter dann käsig-krümelig werdend. Geschmack mild, in der Jugend hie und da schärflich, mitunter auch bitterlich.

Der scheinbar harmlose Pilz kann zu gewissen Zeiten Unheil anrichten. Wir selbst hatten nach Genuss von Speisen, die diesen Pilz enthielten, nicht unbedeutende Magenbeschwerden. Unter anderem hatte auch eine Schrebergärtnersfrau am Riederberg Grüntäublinge gesammelt, sie am Abend um 18 Uhr verspeist. Um 23 Uhr wurde ihr übel; Erbrechen, Durchfall und Schwindelanfälle führten fast zur Bewusstlosigkeit und veranlassten den Arzt, die Erkrankte sofort in das Spital transportieren zu lassen. Am dritten Tag besuchten wir die Frau im Spital und zeigten ihr zwei Stück *R. furcata,* die wir vom Riederberg holten. Sie bestätigte, dass sie solche grüne Täublinge gegessen habe. Am 4. Tag wurde sie aus dem Spital entlassen. Auch von anderen Personen wissen wir, dass sie nach dem Genuss von Grüntäublingen längere Zeit Magenbeschwerden hatten. Wieder andere Personen behaupten, dass ihnen die grünen Täublinge nicht schaden.

Wir haben uns aus diesem Grunde bemüht, die grünen Täublinge so weit als möglich zu fixieren, damit weiteres Unheil vermieden werden kann. Selbstverständlich können auch noch weitere Varietäten festgestellt werden, die mehr oder weniger essbar sind.

Standorte ausser dem Riederberg sind der Pfalzberg und bei Klosterneuburg-Weidling der Siedersgraben. Im Kremstal südwestlich von Gföhl, wo bei einer Führung *R. furcata*, von einer Frau roh genossen, üble Folgen schon nach einer halben Stunde verursachte. Sie konnte sich nur mühsam noch eine weitere halbe Stunde bis zum nächsten Gasthof fortschleppen, musste dort übernachten und konnte erst am nächsten Morgen die Heimreise nicht ohne Beschwerden antreten. Nicht umsonst haben schon Krombholz, Richon et Roze, Bresadola, Ricken und andere Autoren vor diesem Pilz gewarnt.

87. *R. Peltereaui* Sing. 1925. — Grüner Adertäubling.

Syn.: *R. cyanoxantha* (Schaeff.) Fries, var. *Peltereaui* Sing. in Zeitschr. f. Pilzkunde 1925, p. 15.

Icon.: J. Jaccottet, Bern, 1930, t. 37 oben.

Hut fast blaugrün, blass braungrün bis olivgrün, sehr selten ausblassend, Hutoberfläche etwas schmierig, von vielen Adern durchzogen, die von der Mitte bis an den Rand verlaufen. An diesem Merkmal ist diese Art bestimmt zu erkennen. Lamellen weiss, gabelig,

elastisch. Stiel weiss, zuweilen färbig angehaucht, walzenförmig. Fleisch weiss, nicht immer unter der Huthaut grünlich. Geschmack mild. Mischwald im Sommer, fast alljährlich. Im Mauerwald, bei Pressbaum, am Galitzinberg, in der Umgebung von Purkersdorf, im nördlichen Wienerwald bei Hadersfeld.

XVIII. *Cyanoxantha*-Gruppe. — Purpurgrüne Täublinge.

88. *R. cyanoxantha* (Schaeff.) Secr. 1833. — Blautäubling.

Icon.: Cerno. Mach. Pilzfibel, t. 12.

Hut blaupurpurn mit grünlichen Farbtönen, Hutoberfläche wie bei *R. Peltereaui,* von der Mitte bis an den Rand mit blauem oder dunkelgrünem Adernetz durchzogen. Lamellen weiss, fast schmierig, weich, leicht biegsam und sehr reichlich gegabelt, wie bei *R. furcata,* nur sind die Gabeln hier glatt auslaufend und nicht mit einem Höcker versehen. Stiel weiss, öfters violettlich angehaucht. Fleisch weiss. Laub und Nadelwald, Sommer und Herbst alljährlich.

Dieser Täubling dürfte die höchste Stufe der Entwicklung erreicht haben. Die dünne, fast durchsichtige Huthaut haben ausser seinen Verwandten keine anderen Täublingsarten. Diese Art wird schon lange als guter Speisepilz sehr geschätzt.

89. *R. subcompacta* (Britzlm.) Sing. 1932. — Feststieliger Täubling.

Icon.: Bres., Ic. t. 452. — Britzlm. t. 504/71.

Hut auf blassem Grund grauviolett mit grünlichen bis olivgelben Flecken, am Rand mit schwach rötlichen und blass violetten Tönen, Huthaut schmierig, teilweise mit kurzen Adern versehen, sonst glatt, Lamellen weiss, dann etwas cremefärbig, elastisch, wenig gegabelt. Stiel weiss, walzig, hart. Die Stielfestigkeit ist ein gutes Merkmal. Das Hutfleisch ist weiss und nicht mehr so hart. Bei jungen Exemplaren kann es vorkommen, dass sie schärflich sind. Sonst ist der Pilz ungefährlich, verursacht aber in manchen Fällen auch in gekochtem Zustande etwas Unwohlsein. Dies ist einer der ersten Täublinge, die schon im Frühsommer erscheinen. Überall im Laubwald und im Nadelwald. Meist in Gruppen.

XIX. *Vesca*-Gruppe. — Fleischfarbige Täublinge. — Hut rosalila bis hellpurpur. Lamellen, Stiel und Fleisch weiss. Geschmack mild.

90. *R. lilacea* (Quel.) Cooke 1881. — Runzeliger Täubling.

Icon.: Cooke, Illustr. t. 1054.

Hut lilarosa, schmierig, etwas aderig, im Alter mit stark runzeliger Oberhaut, am Rande etwas gerieft. Stiel meist verlängert und rosa angehaucht. Fleisch weich, im Stiel ausgestopft. Der Pilz strömt einen erfrischenden Geruch aus. Buchenwald im Herbst am Hameau-Dombachgraben 1949, Gallizinberg 1950, Mischwald bei Mauer und Purkersdorfer Umgebung 1951.

91. *R. vesca* Fries 1874. — Speise-Täubling.

Icon.: Gramberg t. 23. — J. Schäffer, Russ. 1952, t. III./9.

Hut fleischfarbig, hell bis dunkelpurpurn, die Oberhaut fein netzigaderig, sich am Hutrand vom weissen Fleisch leicht ablösend. Die Lamellenschneiden werden durch Tränen später rostig punktiert, ja es bilden sich im Alter sogar dunkelbraune Streifen. Im Stiel bildet das Fleisch oft Kammern. Im Wienerwald Sommer und Herbst, alljährlich. In Kärnten am Ossiacherberg (südl. des Sees) im Nadelwald so häufig, fast über den ganzen Berg verbreitet, Sommer 1946 u. 1947.

XX. *Brunnea*-Gruppe. — Milder Brauntäubling.

92. *R. avellanea* Zvara 1927. — Haselnussbrauner Täubling

Icon.: Cooke, Illustr. t. 1045.

Hut blassocker bis haselnussbraun, schmierig, schwach feinaderig, Rand eng und lang gerieft. Lamellen, Stiel und Fleisch weiss. Geschmack angenehm mild. Im Eichenmischwald, wo auch *R. vesca* vorhanden war, stand auch eine Gruppe von diesem dünnfleischigen Täubling; bei Unter-Petersdorf im Burgenland, 1944. Unter Buchen bei Laab am Walde, 1952. Dieser Pilz ist bei uns sehr selten.

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Die beigefügten Zahlen bedeuten die Nummern der Arten. Die Zahlen in Klammern sind Arten, die nur aus der Literatur erwähnt werden: *Adelae,* Cerno. 15. — *adusta* (Pers.) Krombh. 6. — *aeruginea* (Lindbl.) Fries 77. — *albonigra* Krombh. 5. — *alutacea* (Pers.) Fries. 58. — *amethystina* Quel. 72. — *amoena* Quel. (71). — *argyracea* n. sp. 80. — *atropurpurea* Krombh. 33. — *atrorubens* (Quel.) Sing. 42. — *aurantiolutea* (Kauffm.) Bres. 66. — *aurata* (With.) Rick. 53. — *aurora* Krombh. 47. — *avellanea* Zvara 92. — *azurea* Bres. 75. — *Bachii* n. sp. 48. — *badia* Quel. (26). — *brunneomarginata* n. sp. 83. — *caerulea* (Pers.) Cooke 73. — *cavipes* Britzlm. 29. — *chamaeleontina* Fries 65. — *chloroides* Krombh. (1). — *chrysodacryon* Sing. 25. — *citrina* Gill. 70. — *claroflava* Grove. (12). — *consobrina* Fries 24. — *curtipes* Möll. et Schäff. 59. — *cyanoxantha* (Schaeff.) Secr. 88. — *decolorans* Fries 9. — *delica* Fries 2. — *densifolia* Secr. 4. — *drimea* Cooke 27. — *elaeodes* Bres. (14). — *elephantina* (Bolt.) Sing. 8. — *emetica* (Schaeff.) Fries 36. — *erythropoda* Pelt. (13). — *exalbicans* (Secr.) Sing. 43. — *exsuccus* Smith. (1). — *fallax* Fries 31. — *farinipes* (Rom.) Britzlm. 16. — *fellea* Fries 19. — *flava* (Rom.) Bres. 12. —

foetens (Pers.) Rick. 17. — *fragilis* (Pers.) Fries 37. — *furcata* (Gmel.) Schwalb. 86. — *glaucophylla* (Quel.) Sing. 1. — *graminicolor* Secr. 78. — *grata* Britzlm. 21. — *graveolens* (Rom.) Britzlm. (13). — *heterophylla* Fries 82. — *integra* (Linné) Fries 63. — *languida* n. sp., 60. — *lepida* (Fries) Rick. 45. — *lilacea* Quel. 90. — *Linnaei* Fries 46. — *lutea* (Huds.) Rick. 67. — *luteotacta* Rea. 40. — *maculata* (Quel.) Bres. 51. — *maculata* (Quel.) Cooke. 54. — *Mairei* Sing. 41. — *mollis* Quel. 76. — *mustelina* Fries (8). — *nauseosa* (Pers.) Rick. 55. — *nigricans* Bull. 3. — *nitida* (P.) Fr. 64. — *obscura* Rom. (11). — *ochracea* (Pers.) Fries 68. — *ochroleuca* (Pers.) Fries 20. — *ochroviridis* Cooke 85. — *olivacea* Schaeff. 61. — *olivascens* (Pers.) Fries 14. — *olivascens* Sing. 14. — *paludosa* Britzlm. 50. — *pectinata* Fries 22. — *Peltereaui* Sing. 87. — *peracris* Britzlm. 26. — *pseudoaurata* J. Schäff. 52. — *pseudointegra* Arn. et Gor. 44. — *puellaris* Fries 56. — *punctata* Krombh. 74. — *purpurea* Gill. 32. — *Quelétii* Fries 28. — *Romellii* (Maire) Bres. 49. — *rosacea* (Pers.) Fries 39. — *rosea* Quel. (47). — *sanguinea* Bull. 38. — *sardonia* Fr. (25). — *Schiffneri* Sing. 35. — *Schoeffeli* n. sp. 62. — *semicrema* Fries 7. — *serotina* Quel. 81. — *solaris* Ferd. et Winge. 69. — *sororia* Fries. — *Steinbachii* Cerno. et Singer. 10. — *subcompacta* (Britzlm.) Sing. 89. — *subfoetens* Smith. 18. — *subtomentosa* n. sp. 84. — *Turci* Bres. (72). — *versicolor* J. Schäff. 57. — *vesca* Fries 91. — *veternosa* Fr. 34. — *vinosa* Lindbl. 11. — *violascens* Gill. 30. — *violeipes* Quel. 71. — *virescens* Schaeff. 79. — *xerampelina* Schaeff. 13.

Über eine neue Sclerogaster-Art aus Böhmen: Sclerogaster gastrosporioides Pil. et Svr.

Von Albert Pilát und Mirko Svrček (National-Museum in Prag).

Im Juli 1939 fand Albert Pilát auf einem trockenen, grasigen Abhang seines Gartens in Černolice bei Dobřichovice, ca. 20 km südwestlich von Prag 8 Fruchtkörper eines Pilzes, der auf den ersten Blick dem *Gastrosporium simplex* Matt. sehr ähnlich war. *Gastrosporium simplex* ist an ähnlichen Orten in Mittel-Böhmen sehr verbreitet, unterscheidet sich aber von dem neuen Pilz nicht nur mikroskopisch, sondern auch durch seine weiche Konsistenz.

Sclerogaster gastrosporioides Pilát et Svrček sp. n.

Fruchtkörper unterirdisch, kugelig bis etwas eiförmig oder knollenförmig, getrocknet 4—7 mm im Durchmesser oder ca. 4 ⇌ 7 mm

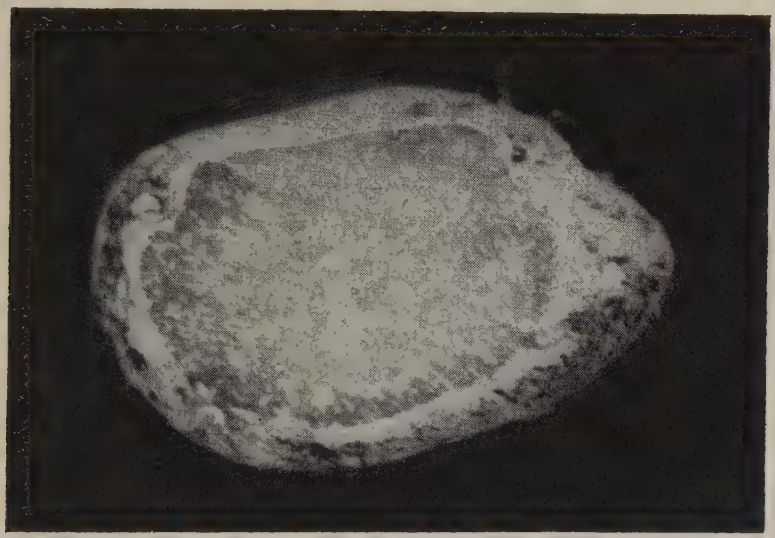

Fig. 1. *Sclerogaster gastrosporioides* Pil. et Svr. Fruchtkörper im Durchschnitt stark vergrössert. Černolice bei Dobřichovice in Mittel-Böhmen, VII. 1939 von A. Pilát gesammelt. Photo A. Pilát.

gross. Peridium nicht abschälbar, wattenartig, dünn, an der Oberfläche rauh filzig, zum Teil mit angeklebten Erdteilchen, rein weiss, feinfilzig, durch weisse, feine Mycelfäden in das Substrat übergehend. Das Mycel bildet keine weissen Stränge, bedeckt aber die Oberfläche der abgestorbenen Graswurzeln und anderer organischer Überreste. Die Gleba der frischen Fruchtkörper ist gummiartig elastisch, die der trockenen knochenartig hart, am Durchschnitt kompakt, fast ohne Höhlungen, aber zusammengesetzt aus sehr kleinen

Kammern, welche völlig mit Sporen ausgestopft sind. Am Durchschnitt sind die Kammern rundlich bis unregelmässig elliptisch, ca. 80 ⇌ 250 μ gross. Die Farbe der frischen Gleba ist ocker, der trockenen hellocker. Die Tramaplatten der Gleba werden aus undeutlichen, gelifizierten, mehr oder minder parallel durchlaufenden, ca. 3.5 μ dicken Hyphen gebildet. Das 250—350 μ dicke Peridium besteht aus dicht unregelmässig verflochtenen, farblosen, sehr dünnwandigen, unregelmässig verzweigten, 3.5—8 μ dicken, ziemlich undeutlichen Hyphen, welche an der Oberfläche mit Kalziumoxalat-Krystallen dicht besetzt sind. Sporen regelmässig kugelig, 6.4—8.3 μ im Durchmesser, mit ziemlich dicker (1—1.5 μ) Membran, an der Oberfläche kurzstachelig, mit spitzen oder etwas abgestumpften, ca. 1.5 μ langen Stacheln, welche, ca. 40—50 an der Zahl, die Sporenoberfläche

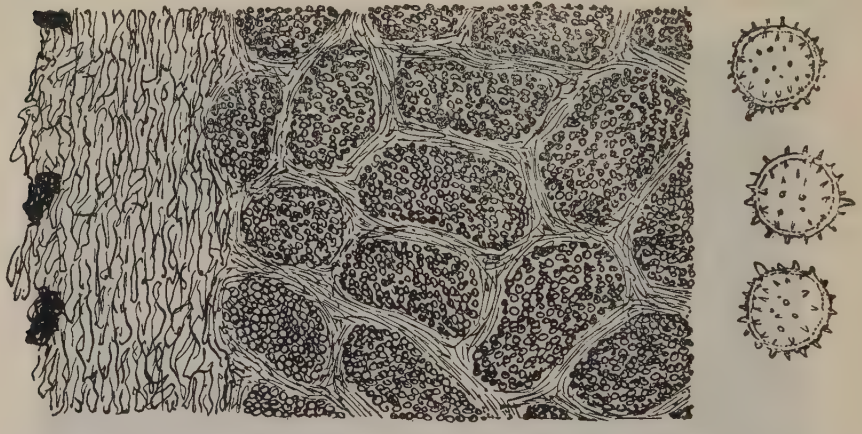

Fig. 2. *Sclerogaster gastrosporioides* Pil. et Svr. Schematischer Durchschnitt in der Nähe der Oberfläche. Rechts drei Sporen A. Pilát ad nat. del.

regelmässig bedecken und fast alle gleich lang sind. In KOH-Lösung treten die Stacheln deutlicher hervor. Die Sporen sind unter dem Mikroskop fast farblos oder blass elfenbeingelblich, nicht amyloid. Der Apikulus an der Sporenbasis ist kegelförmig, 1.5—2 μ lang und farblos.

Hab. Böhmen: Černolice bei Dobřichovice, ca. 20 km südwestlich von Prag, auf sehr trockenem, grasigem, gegen Süden exponiertem Abhang auf kalkfreier Schieferunterlage, ca. 3—5 cm unter der Erdoberfläche, zwischen Graswurzeln 8 Exemplare VII. 1939, leg. Albert P i l á t.

Diese neue Art ist bis jetzt die einzige *Sclerogaster*-Art, welche aus Böhmen bekannt ist. Unter ähnlichen ökologischen Bedingungen wächst wahrscheinlich *Sclerogaster Broomeianus* Zeller et Dodge, der auch zwischen Graswurzeln in Süd-England gefunden wurde,

sich aber besonders durch sein abschälbares Peridium und etwas kleinere Sporen unterscheidet. Alle übrigen bis jetzt bekannten *Sclerogaster*-Arten wachsen im Waldhumus. Von diesen Arten haben nur *Sclerogaster candidus* (Tul.) Zeller et Dodge und *Sclerogaster compactus* (Tul.) Sacc. ein unabschälbares Peridium. Die zuerst genannte Art unterscheidet sich von *S. gastrosporioides* durch später blassgelbliches, viel dünneres Peridium und durch gefärbte Sporen. Die zweite Art hat eine deutliche, in die Gleba eindringende Columella und nur 4—6 μ grosse Sporen.

Species nova generis *Sclerogaster: S. gastrosporioides* Pil. et Svr.

Sclerogaster gastrosporioides sp. n.

Carposoma sphaericum, subovoideum vel tuberosum, exsiccatum 4—7 mm diam. vel ca. 4 ⇌ 7 mm magnum, peridio haud secernibili, 250—350 μ crasso, tomentoso vel gossypino albo vel candido tectum, absque funiculis mycelialibus, solum mycelio arachnoideo albo subtilique in substratum eradians et radiculos graminum et detritum varium obtegit. Gleba viva gummoso-elastica, exsiccata osseodura, e cellulis parvis, sectis rotundatis, elongatis, ellipsoideis, haud raro parte media subconstrictis, ca. 80 ⇌ 250 μ magnis constat. Cellulae maturae totaliter sporis farctae sunt. Color glebae vivae ochraceus, exsiccatae pallide ochraceus est. Parietes cellularum e hyphis parum distinctis, gelificatis, conferte subparalleliter intricatis, ca. 3.5 μ crassis constat. Columella solum in speciminibus iuvenilibus basi evoluta est, dein vix conspecta. Peridium e hyphis sat conferte intricatis, hyalinis, tenuissime tunicatis et irregulariter ramosis, parum distinctis, 3.5—8 μ crassis, crystallis calcii oxalatici agglutinatis haud provisis constat. Sporae regulariter globosae, 6.4—8.3 μ diam., membrana subcrassa (1.1—5 μ), breviter echinata provisae, subhyalinae vel pallidissime eburneae, non amyloideae, apiculo conico, 1.5—2 μ longo instructae. Aculei exosporii acuti vel subacuti, regulariter in no. 40—50 ad superficiem dispositae et subaequilongae.

Hab. Inter radices graminum etc. ca. 3—5 cm sub terra loco graminoso, arido, in declivitate ad meridiem exposita solo schistaceo prope Černolice, haud procul Dobřichovice, Bohemiae centralis, VII. 1939, Albert Pilát legit.

Habitu macrospopico carposomata parva *Gastrosporii simplicis* Matt. in mentem revocat. Locis similibus etiam inter radices graminum *Sclerogaster Broomeianus* Zeller et Dodge in Britannia meridionali crescit, qui peridio secernibili et sporis minoribus a specie nostra differt. Species ceterae generis *Sclerogaster* in humo silvatico crescunt et characteribus macro- et microscopicis a specie nostra discrepant.

Typus in herbario Musei Nationalis Pragae asservatur.

Resting Spore Germination in Synchytrium.*)

By John S. Karling.

Department of Biological Sciences Purdue University, Lafayette, Indiana, USA.

With 1 Textfig.

The resting spores of *Synchytrium,* which may or may not be of zygotic origin, are reported to function as sporangia, or sori or prosori in germination, and such differences are recognized as basic distinctions of the subgenera into which the genus is divided. Discovery of the method by which the resting spores germinate is, therefore, essential to the identification and proper classification of species. Up to the present time it has been observed in less than a score of the 175 or more species which comprise the genus.

In recent studies on *Synchytrium* the author has collected resting spores of several species with the objective of determining their manner of germination. Report has already been made (1954, 1955 C) of this process for *S. brownii* and *S. australe,* and the present contribution concerns germination in *S. stellariae (S. chiltonii), S. geranii, S. edgertonii, S. cerastii and S. aureum.* The resting spores of these species were collected on their hosts during March to June, 1954 in Texas and Louisiana and stored in envelopes at room temperatures until February 1955. On February 5 pieces of the host with the spores were crumbled as finely as possible between the thumb and forefinger and allowed to fall on a petri dish of plain agar. By this method numerous spores are dislodged from the galls and lie free on the agar where their subsequent germination may be readily observed under the stereoscopic microscope. The surface of the agar plate was allowed to dry until the spores and host debris were firmly stuck to it, after which it was flooded with a film of animal charcoal water. The dishes were covered and left on the laboratory table at room temperatures.

On February 15, ten days after sowing, numerous spores had germinated, and by February 18 sori, sporangia and zoospores were present. In all species the resting spore functioned as a prosorus and gave rise to a superficial, attached sorus (fig. 1). Inasmuch as the process was basically similar in all species, it is illustrated in only one species, *S. geranii* (fig. 1—5). The process of germination

*) This study has been supported by a grant from the National Science Foundation.

is fundamentally the same as described by the author (1955 C) for *S. australe* and need not be described again in detail.

In all species many of the spores germinated within the galls, and in some instances the sorus was pushed out through the apical pore or opening of the gall. In the species on *Solidago* sp., which the author is calling *S. aureum* because it forms only resting spores and has previously been reported on this host, the sorus was occasionally formed beneath the resting spore in the base of the gall. As it ex-

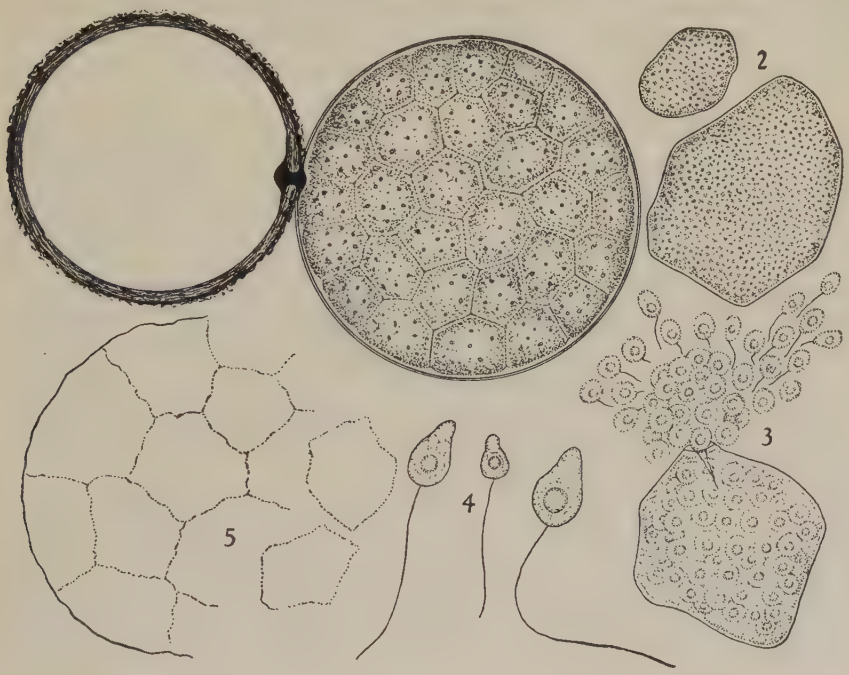

Fig. 1—5. *Synchytrium geranii*. Fig. 1. Empty resting spore with attached sorus. Fig. 2. Variations in size of sporangia. Fig. 3. Discharge of zoospores. Fig. 4. Variations in uniflagellate zoospores. Fig. 5. Cracked wall of sorus.

panded the empty spore was pushed out of the apical gall opening. In all species the sorus was rather firmly attached to the empty spore at the pore through which the protoplasm had emerged. Closer examination of this region showed that the pore had been filled with a plug of tough, resistant material (fig. 1) like that shown by K u s a n o (1930) for *S. fulgens*. The sori and sporangia usually remains viable on the agar plate for a long time. Sporangia which were three weeks old produced abundant zoospores when placed in fresh animal charcoal water. This prolonged viability is obviously advantageous to the fungus in the spring as the young host plants are emerging from the soil and insures periodic infection.

In the case of *S. aureum* the sporangia produced and emitted its zoospores while still in the sorus, and eventually such partially open sori had the appearance of a sphere filled with empty hyaline polyhedra. In this species mounted sporangia "germinated" and produced zoospores periodically over a period of three days.

The wall of the empty sorus of *S. geranii* was usually scored or cracked in a definite pattern so that it appeared to be made up of irregular pentagons or hexagons in cross section. The borders of these areas meet in 3s at angles of approximately 120°, as shown in fig. 5. These areas may separate along the cracks and lie free and isolated. The cause and significance of this cracking is unknown, but it is a frequent and striking occurrence.

Careful attention and study has been given to the zoospores produced by the germinated zoospores to determine if they function as gametes and fuse. Fusion was observed in only a few cases in *S. aureum* after the zoospores had passed through the actively motile stage. Both gametes were only sluggishly motile, and no difference in motility was noted between the so-called male and female gametes. Fusion occurred side by side with the flagella extending in opposite directions. This arrangement of the flagella remained for some time in the zygote, but eventually they become posterior. The zygote was sluggish in movement for a short time and then came to rest completely. Fusion also occurred between uni- and biflagellate as well as between two biflagellate cells.

In discussing the possible relationships and phylogeny of the genus the author (1955 a) suggested that secondary sporangia and zoospores might possibly be found in *Synchytrium* which would link it more closely with *Endodesmidium* and *Micromycopsis,* the other genera of the family Synchytriaceae in which such stages occur. Therefore, careful observations of the zoospores were made to see if they encysted, developed into sporangia, and produced minute secondary zoospores, but no evidence of this was found.

A brief description of the sori, sporangia and zoospores produced by the germinated resting spores of these species is presented as follows:

Synchytrium stellariae on *Stellaria media.*

Resting spores subspherical to spherical, 52—160 μ; sorus yellowish-orange, spherical 65—170 μ; sporangia 8—35 per sorus, highly variable in size, predominantly polyhedral, 22—80 μ in greatest diameter; zoospores oval to slightly elongate, 3.6—4 ⇌ 4.8 ⇌ 5.6 μ.

Synchytrium geranii on *Geranium carolinianum.*

Resting spores spherical 140—210 μ, oval, 130—180 ⇌ 150—200 μ; sorus yellowish-orange, spherical, 145—215 μ; sporangia up to more than 200 per sorus, light-orange, predominantly polyhedral, 30—68 μ in greatest diameter: zoospores oval to slightly elongate, 3 ⇌ 4—4.5 μ.

Synchytrium aureum (?) on *Solidago* sp.

Resting spores spherical, 120—144 μ with an olive-drab colored wall; sorus yellowish-orange, spherical, 132—150 μ; sporangia up to more than 100 per sorus, orange, small, predominantly polyhedral, 18—35 μ in greatest diameter; zoospores oval to slightly elongate, 3—3.2 ⇌ 4—4.8 μ.

Synchytrium edgertonii on *Dichondra repens.*

Resting spores oval to spherical, 120—192 μ with a light amber wall; sorus brilliantly yellow, spherical 140—210 μ; sporangia up to 245 per sorus, yellow, small, predominantly polyhedral, 16—34 μ in greatest diameter; zoospores almost spherical, 3.2—4 μ.

Synchytrium cerastii on *Cerastium viscosum.*

Resting spores spherical, 30—80 μ, oval, 35—52 ⇌ 54—68 μ; sorus yellow, spherical, 38—75 μ, oval, 40—60 ⇌ 65—80 μ sporangia 10—50 per sorus, yellow, predominantly polyhedral, 20—58 μ in greatest diameter; zoospores oval to slightly elongate, 2.8—3.2 ⇌ 3.6—4.2 μ.

The discovery of resting spore germination in *Synchytrium stellariae, S. geranii, S. edgertonii, S. cerastii* and *S. aureum* make it possible to classify these species with certainty. The author (1954, 1955 d, e) has already shown that the initial cell in the summer sporangial cycle of the first four of these species functions as a prosorus. The present discovery that their resting spores function in the same manner shows that they belong in the subgenus *Microsynchytrium,* according to the author's (1953, 1955 b) interpretation of this group. These four additional species brings the total to six terrestrial species which can now be definitely assigned to this subgenus. Also, the method of spore germination in the so-called *S. aureum* on goldenrod shows that it belongs to the subgenus *Pycnochytrium.*

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Observations on Meliolicolous Hyphales from Santo Domingo.

By R. Ciferri (Italian Cryptogamic Laboratory, the University, Pavia.
With 13 Textfigures.

1) On Meliolicolous species of the genus *Helminthosporium.*

Amongst the meliolicolous, tropical fungi, species of the genera *Helminthosporium* and *Arthrobotryum-Podosporium* are the most frequent, so that, in the past, were considered as conidial stages of the *Meliolae.* In very many cases it is impossible to observe a *Meliola* specimen free from associate fungi, and the specific determination of *Meliola* (and other foliicolous *Ascomycetes*) is more or less ambiguous, because the poor fructification, if any, and the modification

Fig. 1. *Helminthosporium panici* Stev.: a) habitus; b) tuft with conidiophores and conidia; c) conidiophores; d) conidia.

of some vegetative organs (disposition, density and branching of mycelium; number and shape or size of hyphopodia; presence, number, disposition, size and shape of setae, and so on). This fact has been repeatedly noted in our revision of Dominican *Meliolae* (Mycopath. et Mycol. Appl. Vol. VII. N. 1/2, 1954), chiefly for the taxonomic, reciprocal position of glabrous and setose species. Together with keys of commonest or surest species found in the Dominican Republic, in the following pages we enlarged or emended or discussed a few species, based on average specimens more than on one typical specimen.

Hughes (I.M.I. Pap. N. 50, pag. 19—29. 1953) revised a number of species of meliolicolous *Helminthosporia* on material from the Gold Coast and Togoland. He recognized 4 species and one variety, reducing 8 species as synonym of *H. capense* Thuem.; 3 species under *H. dasycarpum* Mont. and 2 under *H. helleri* Stev. (not considerating the species here attributed to the genus *Spiropes*).

In our opinion the species concept adopted by this well distinguished mycologist is too wide; e. g. for *H. capense* he considered the lenght of conidiophores variable from 50 to 650 μ, tufted or single, and the conidia up to 78 μ in lenght and 6 to 13 μ wide; for *H. dasycarpum* the conidiophores 30 to 750 μ long and conidia of very variable shape up to caudate, from 14—28 up to 55 μ long.

From the Hughes' widened descriptions is not possible to reconstitute the characteristics of the original *H. capense* and *H. dasycarpum,* so that these species are not considered here.

Helminthosporium panici Stev.

Foliar spots indefinite, brown to blackish, scattered, (evidently old *Melicola* colonies); conidiophores free and single, or aggregated and few in number, to truly fasciculated, rarely up to 30 in number, sub-reptant, dull-brown in color, with lighter end (up to sub-hyaline), not torulose or very slightly so, free end sub-dentate up to almost smooth, rounded, scarcely and obscurely septate, 115—180 by 8—10 μ; conidia single, acrogenous or almost, elongated, very dull-brown, without differentiate end or, if so, short end not evident, as a rule 3-septate, infrequently 1—2-septate, very rarely 4-septate, not narrowed (or very little and rarely) narrowed at the septa, cells of the same color and size, most frequently ellipsoidal-truncate in shape, 50—75 by 10—13 μ, but also smaller (35—40 by 7—9 μ) and also ellipsoidal-elongate, with rounded to truncate ends, not or very little narrowed at the ends, but rarely also very narrowed (and truncate) at the apical end, and more or less enlarged at the basal end (and truncate, never rounded).

A quite common species on different *Meliolae,* chiefly on truly epiphytic species with diffuse to crustose spots.

Helminthosporium helleri Stev.

Foliar spots velwety, diffuse, black, chiefly on old *Meliola* mycelium; conidiophores brown, single, erect or sub-erect, straight or flexuose, 100—200 μ long, 5—7 μ thick, sub-dentate or quite smooth at the free end; conidia as a rule 3-septate, variable in shape, as a rule sub-fusate, with truncate basal end and beaked free end, apical and basal cells light in color, central cells inflated and darkened, slightly constricted at the central septum or not, 20—40 ⇌ 6—10 μ,

with a more or less evident apical beak, 5—10 μ long, wall thin, seldom roughened.

This species (identic, according Hughes, with *H. leucosykae* Yates and *H. maculosum* Sacc.) is very little distinct from *H. palmetto* Gerard, may be only because the conidia of the last named species are thick-walled. Probably *H. helleri* is but only a variety of *H. palmetto,* the last one -- apparently — preferring the *Meliolae* on Palmae.

Helminthosporium portoricense (Speg.) n. comb.

Napicladium portoricense has been described by Spegazzini on living leaves of many species (chiefly on coriaceous leaves), probably parasitic on the mycelium of Perisporiaceous or *Meliolae* species in Puerto Rico (Bol. Acad. Nac. Ci. Cordoba, Vol. XXVI, pag. 363. 1927).

Many times we observed, on *Meliola* spp. in the Dominican Republic, a fungus having sterile hyphae 2—3 μ thick, olive-brown in color, with adscending conidiophores, single or aggregated in tufts, very variable in lenght (from 25 to 250 μ), 2—5 μ wide, bearing one conidium each; conidia elongate-fusoid, with a more or less elongated free end, also very narrowed to acutate, with an almost rounded base, typically 5-cellular (4-septate), but also 3-septate (very rarely 2-septate), a little narrowed at the septa or not at all, smooth, olive-brown or brown, 30—60 by 6—10 μ.

In spite of the fact that we dont studied the authentic, Spegazzinian specimen, we have no doubt that our specimens are referable to *Napicladium portoricensis,* a true meliolicolous species. Probably this fungus has been attributed to the genus *Napicladium* because the tender, not rigid conidiophores, in spite of the fact that, in the spanish description, the conidiophores are described as variable from tender to rigid; at least the conidiophores are shorter and tender than in the ordinary, meliolicolous species of *Helminthosporium.* Also the conidia are thin-walled, the species of the genus *Helminthosporium* with thin-walled conidia being less frequent than the thick-walled one.

It is very possible that the fasciculated, mor or less stilbaceous stage, is a *Podosporium* allied, if not identic, to the *Podosporium antillanum* (Frag. et Cif.) Cif. (see), but it is also allied to *H. caespitiferum* Petr. et Cif.

An uncommon species in the unaggregated stage of fructification; more common in the presumed stilbaceous stage.

Helminthosporium melioloides Sacc.

Species described by Saccardo (Atti Acc. Ven. Trent.-Istr., Vol. X, pag. 89. 1917) associated with *Meliola* sp. on *Uvaria* sp., Philippine Islands.

An uncommon species, found on scattered, as a rule undeterminable *Meliola* specimens. It is evidently allied but distinct from *H. parathesicolum* Stev. (Bot. Gaz., Vol. LXV, pag. 242. 1918). In *H. parathesicolum* the mycelium is thin, not radiate, the conidiophores more or less reptant, the conidia of the same shade in color, while in *H. melioloides* the mycelium is thick, mor or less radiate, the conidiophores more or less erect (as a rule suberect), and one or both the central cells of the conidium darker.

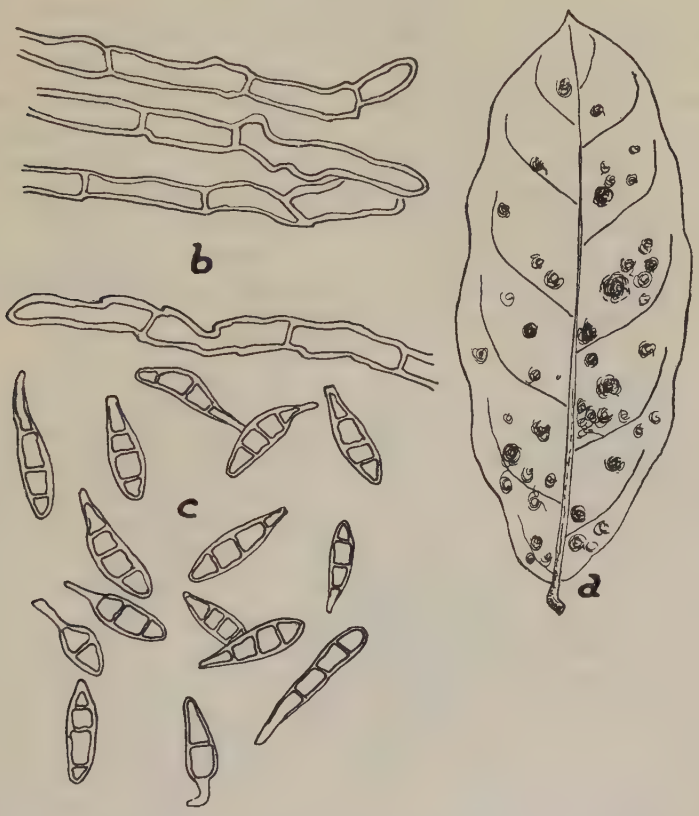

Fig. 2. *Helminthosporium ocoteae* Stev.: a) habitus on a leaf of *Ocotea*; b) conidiophores; c) conidia.

Helminthosporium insigne Sacc.

Described by Saccardo (l. c. p. 89. 1918) on *Meliola insignis* Gaill. (and figured by Gaillard, l. c., pl. VI, fig. 1) on *Mallotus philippinensis* in the Philippine Islands.

This species is variable from a true, sparingly fasciculated *Helminthosporium* up to and almost stilbaceous *Podosporium*-like fungus, and the attribution to one or the other genus may be matter of

personal opinion. The conidiophores are short, up to 500 μ in lenght (600—800 μ in the original description), 5—7 μ in thickness, dull-brown in color, the free end more or less laterally curved, denticulate, pluriconidial; conidia elliptic to subclavate, straight to sub-falcate, without beak, narrowed but truncate at the basal end, narrowed and sub-acutate at the free end, 3—5-septate, as a rule 4—5-septate, not narrowed at the septa, dull-brown and uniform in color, 40—60 by 6—8.5 μ, as a rule 42—55 by 7—8 μ.

In any atypic, almost stilbaceous specimen (as, e. g., on *Meliola amomicola* Stev., spec. *No. 2860*), the conidiophores are more or less clearly synnemataceous, forming a stalk up to 50 μ in diam., composed of brown, septate conidiophores, more or less erect, shorter (150—200 or more μ in lenght, to 10 μ thick), with apical or acro-pleurogenous conidia brown, from not septate to 1—2-septate (rarely 3; exceptionally 4—5-septate), not narrowed near the septa, large (50—70 by 10—13 μ), basal end narrowed but truncate, free end rounded. (Conidia up to 100 by 20 μ, 2—3, but also 4—5-septate, brown, longely caudate, narrowed at the septa are frequently present; it is presumed that are pertaining to another species).

Helminthosporium guareicolum Stev.

Described by Stevens (l. c. pag. 241. 1918) on *Meliola guareicola* on *Guarea trichilioides* in Puerto Rico. This is a quite uncommon species aberrant from the cogeneric, meliolicolous species, for the irregularly thickned up to the zig-zag shape of the conidiophores. The mycelium is composed of a loose net of hyphae, septate, irregularly distributed, straight or almost so, the conidiophores rigid and darker, few to abundant in number, sub-erect to erect, irregularly distributed, straight or almost so, rigid and darker in the basal portion, tender and paler in the apical part, 50 to 150—180 μ long, as a rule of the same thickness of the sterile hyphae, but also up to 6—7 μ and irregularly thickened, in many cases with one or a few scattered, contiguous or isolated cells also of 8—10 μ in thickness, of variable lenght, but also short (then with a toruloid aspect of the conidiophore), delimitated by two septa, and, as a rule, here darker; conidia produced on a little evident apical denticulation, a few for each conidiophore and also only one, 3—5-septate, frequently 4—5-septate, 18—32 by 4—6.5 μ, brown and uniform in color, not or very slightly narrowed at the septa, straight or slightly curvate, without beak, free end narrowed but truncate at the top, basal end rounded-truncate.

It is a *Helminthosporium* like species, but it may evenually be distinguished in a separate genus in account of the characteristics of the conidiophore.

Helminthosporium acalyphae (Thuem.) n. comb.

Hab.: in foliis *Acalyphae angustifoliae* Sw. (Euphorbiaceae), Republic Dominicana, Cordillera Central, prov. La Vega, Bonao, in sylvis, coll. E. Ciferri, VIII. 1926 (sine numero).

This species is characterized by the colony asterinoid or confusely radiate, black, opac diffuse and undelimitated, as a rule on the lower page of the leaf; the mycelium (growing on scanty remain of an old *Meliola* mycelium), is dense, formed by dull-brown or blackish,

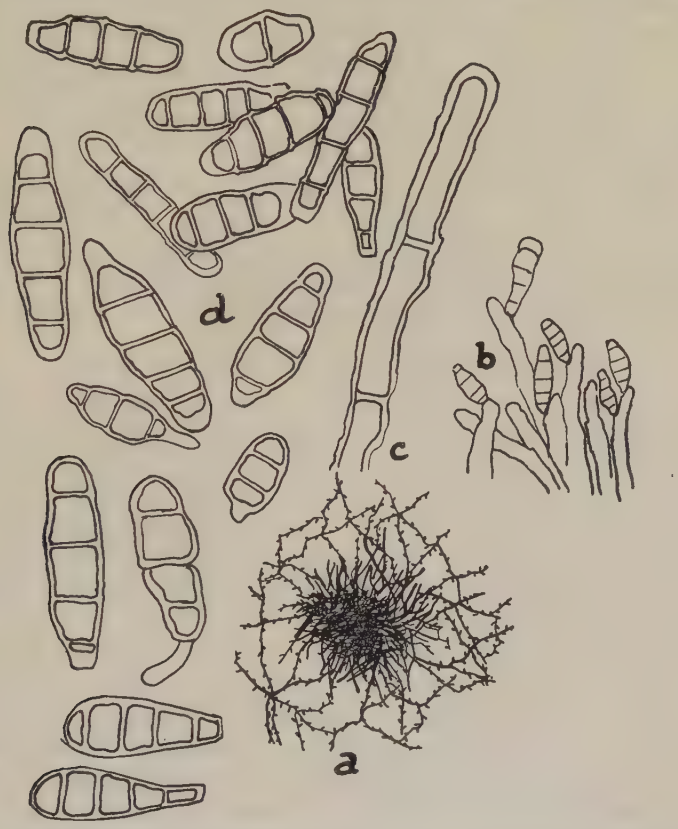

Fig. 3. *Helminthosporium carpocrinum* Cif.:a) tufts on the mycelium of a *Meliola*; b) conidiophores with conidia; c) conidiophores; d) conidia.

branched, almost nettled, sparingly septate hyphae, 2—3,5 μ in thickness; conidiophores erect, individually distinct but more or less loosely aggregate in tufts, simple, superficial, brown-blackish, septate, at the free tip more or less clearly geniculate, of very variable lenght, 2,5—4 μ thick; conidium one for each conidiophore, terminal or subterminal, ovate-ellipsoid, at the free end subacutate, et the basal end

subobtusate, 2—3-septate, olivaceous-brown or dull-brown, not constricted at the septa, 9—16 by 4—6 μ, as a rule 10—14 by 4—6 μ.

An interesting species, apparently growing on or together a *Meliola,* of which only a few residual, sparingly hyphopodiate mycelium is evident. In our opinion, is one of the *Helminthosporium* species with 3-septate conidia listed by Hansford (I. M. I., Bull. 15, pag. 214. 1946).

This species is surely identic to *Ophiotrichum acalyphae* Thuemen (Rev. Mycol., Vol. I, pag. 10. 1879), described also for Santo Domingo (and, up to-now, neglected in the check-list of Dominican fungi) on living leaves of *Acalypha laevigata* Sw. (*A. laevigata* Sw. is not a dominican, but a jamaican species, and it is possible that the thuemenian species of the fungus has been collected in Jamaica and not in Santo Domingo).

This, is a peculiar species of *Helminthosporium,* evidently allied to *H. ocoteae* Stev. but differing for the size (and shape) of many organs, chiefly for the unusual thickness of the conidial septa, so that the cellular lumen is notably reduced. The specimen is so poor that it is not possible a more accurate description of this species.

Helminthosporium crassiseptum n. sp.

Plagulae ut in *Meliola abrupta*; mycelio subtili, 2 μ crasso, diffuso; conidiophoris variabilibus, simplicibus, singulis vel sub-aggregatis, rectis vel prope apicem leniter curvatis, pallidis, delicatis, septatis, 30—50 ⇌ 2—3 μ; conidiis ovoideis vel ellipticis, regularibus et uniformibus, consuete 3-septatis, rarius 2-septatis, pallide-brunneis, concoloribus, 45—55 usque 65 μ longis, 12—14 μ crassis, non caudatis, ad septa non constrictis, septis crassissimis (3—5,5 μ crasssis) et lumine cellularum reducto.

Hab.: cum *Meliola abrupta* in foliis in specim. *No. 3082.*

This species is quite well characterized by the very thick septa and little less thick external episporium of the conidia, so that the lumen of the conidial cells is unusually reduced.

It is allied to *H. acalyphae,* but the conidia are longer; it may be only a variety of this species.

Unfortunately the specimen at hand is overgrowth by other unclassificable fungi, and the species is to be fully redescribed on better material.

It has been found on fragments of mycelium of a sterile Meliolinea growing on *Cissus* sp., Dominican Republic, prov. Santiago, Hato del Yaque, in thickets, I. 1931, leg. R. C., without number.

Spiropes Cif., n. gen.

Typice fungicolus; conidiophora sub-torulosa vel spiralata, sed vere alterne lateraliter incisa, „zig-zag" efformata; conidia singula,

alternantia, pleurogena et acrogena, fusca, elliptica, ovata vel apiculata, transversaliter pluriseptata ut in *Helminthosporio.*

Typus: **S. guareicola** (Stev.) Cif., n. comb. (= *Helminthosporium guareicolum* Stev. [*guareicola* emend. Hughes]; = *H. flagellatum* Yates; = *H. spirotrichum* Sacc.).

Cuspidosporium n. gen.

This genus has been established on the original Saccardo's specimen of *Helminthosporium cuspidatum* (Atti Acc. Ven. Trent.-Istr., pag. 91. 1917) of the Baker collection, collected by Reyes in the

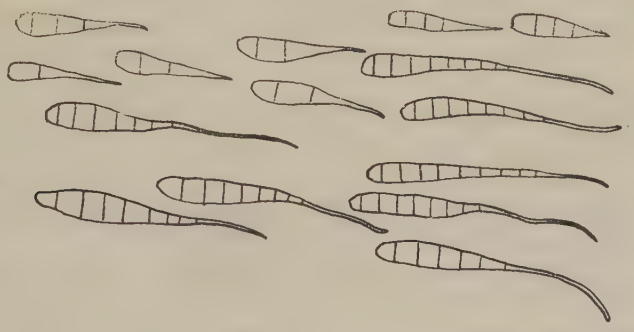

Fig. 4. *Cuspidosporium cuspidatum* (Sacc.) Cif.: conidia.

Philippine Islands on dead branches of *Afzelia rhomboidea,* is spite of the fact that the specimen is meagre. It is well characterized by the slender filiform conidiophores, with small, scattered enlargements, and longely caudate conidia, rounded or rounded-truncate at the base, longely filiform at the free end, when young short and 2—4 septate, then long and up to 12-septate, but, as a rule, not more than 8—10-septate.

Cuspidosporium nob., n. gen.

Dematiaceus, macronemeus; conidiophora delicata, filiformia, hinc inde leviter inflata, monosporia; conidia acrogena, obclavato-elongata, longe attenuata, quasi filiformia-caudata, brunnea, primo 2—3 septata, deinde usque 12-septata, pro more 8—10 septata.

Typus: **C. cuspidatum** (Sacc.) n. comb. (= *Helminthosporium cuspidatum* Sacc.). It is possible that this genus is, really, identic with *Podoconis,* as quoted by Boedijn (Bull. Jard. Bot. Buitenzorg, Vol. XIII, p. 133. 1933) for *P. theae* (Bern.) Boed. (= *Helminthosporium theae* Bern.), and redescribed by Hughes (I. M. I. Myc. Pap. N. 50, p. 58. 1953) for *P. macrura* (Sacc.) Hughes (= *Helminthosporium macrurum* Sacc.) and *P. parva* Hughes (l. c. p. 59. 1953).

Apparently in the genus *Podoconis* the conidiophores are thick and regularly swollen just below the apex, while in *Cuspidosporium*

are filiform and a little swollened also below the tip; the conidia of *Podoconis* are 3—5 septate, while those of *Cuspidosporium* are at first 2—3-septate, then up to 12-septate (as a rule 8—10-septate).

The widening of the genus *Podoconis* to include also *H. cuspidatum* (eventually with two subgenera) may be another acceptable solution.

Key of the dominican species of Meliolicolous *Helminthosporium*:

A) Conidia as a rule 3- to more septate (3—7 septate).
  B) Conidiophores not or very rarely fasciculate.
    C) Spots diffused; conidiophores never fasciculated, 25—250 by 2—5 μ; conidia typically 3—4, up to 1—2-septate, 30—60 by 6—10 μ *H. portoricense* (Speg.) Cif.
    CC) Spots aggregated in tufts; conidiophores single to fasciculated, 150—300 by 6—8 μ; conidia typically 3—5, up to 6—7 septate, 18—42 by 8—11 μ *H. caespitiferum* Petr. et Cif.
  BB) Conidiophores variable from free to sub-fasciculate up to almost synnematoid.
    E) Conidia 40—60 up to 70 μ in lenght *H. insigne* Sacc.
    EE) Conidia 22—30 μ in lenght *H. carpocrinum* Cif.
AA) Conidia not often more than 3-septate.
  F) Conidiophores pale, translucent.
    G) Conidiophores 130—200 μ long; conidia 20—30 by 4—6 μ, with normally thin septa *H. ocoteae* Stev.
  FF) Conidiophores brown, more or less opac, but also rarely paler at the free end.
    GG) Conidiophores 30 μ long; conidia 45—55 by 22—44 μ, with very thickened septa *H. crassiseptum* Cif.
    H) Conidia usually not strongly differentiated at the ends.
      I) Conidiophores 250—300 μ long.
        L) Conidiophores 3 μ in thickness; conidia thin-walled, rough *H. melastomacearum* Stev.
        LL) Conidiophores 6—8 μ in thickness; conidia thick-walled, smooth *H. melioloides* Sacc.
      II) Conidiophores 100—250 μ long *H. panici* Stev.
    HH) Conidia usually strongly differentiated at the ends.
      M) Beak short, usually 7 μ or less.
        N) Conidia of the same shade, thin-walled (conidiophores free) *H. parathesicola* Stev.
        NN) Conidia with central darker cells thick-walled (conidiophores also sub-fasciculated; see above) *H. melioloides* Sacc.
      MM) Beak longer, usually more than 7 μ.
        O) Conidiophores thick, 7 μ.

P) Conidia thin-walled — *H. helleri* Stev.
PP) Conidia thick-walled — *H. palmetto* Gerard
OO) Conidiophores thinner, 4 μ — *H. philodendri* Stev.
EEE) Conidia 9—16 μ in lenght — *H. acalyphae* (Thüm.) Cif.

We suspect that also *H. naviculae* Syd. (Hedwigia, Vol. XLII, pag. 106. 1903), found on leaves of an Euphorbiacea in Brasil by Ule is another meliolicolous species, but we never observed a full developed stage; as a rule, only a few, scattered conidia are found amongst other symbiotic fungi. It is clearly recognizable by the „navicular" shape of the 2-septate, yellow to very pale-brown conidia, not narrowed at the septa, having both ends very narrowed, short and abruptly curved, simulating the side view of a boat with slightly raised prow and stern, of 55—90 by 10—15 μ.

2. On Meliolicolous species of the genus *Podosporium.*

The nomenclature of the stilbaceous, meliolicolous *Helminthosporia* is puzzling. The oldest generic name appears to be *Arthrographium* Ces., then substituted by *Arthrobotryum* Ces. Hughes (Naturalist, p. 171—173. 1951) revised the type of Cesati and identified the fungus as *Sporochisma saccardoi* Mason et Hughes. The last named students revised a few species erroneously attributed to this genus (Naturalist, p. 171, 1951), and redescribed *A. stilboideum* on british material (see also Mason and Hughes, ibid. p. 97 1951).

We are in condition to confirmate that the specimen of Cesati fungus (in Klotzsch, Herb. Myc. Viv., E. N., N. 139. 1855) is devoid of any stilbaceous fungus. Of other hand the italian material (see Ferraris, Hyphales, p. 191. 1910) of *A. stilboideum* is that of a lignicolous, stilbaceous fungus, with densely penicillate synnemata, fertile at the very top and in some case producing conidia aggregated with slime; the conidia are elliptic or ovoidal, thin-walled and smooth, typically 3-septate, brownish in color, of a *Helminthosporium* general shape.

A. stilboideum Ces. (= *Arthrographium stilboideum* Ces.) is a fungus, quite frequent in Italy on more or less rotten wood, of course, not meliolicolous. The first doubtful meliolicolous described species is *A. melanoplaca* Berkeley et Curtis (Journ. Linn. Soc. Bot., Vol. X, p. 360. 1869) found in Cuba on *Psychotria* leaves, in spite of the fact that no *Meliola* species are quoted. Without an examination of the authentic specimen, this species is unrecognizable, having been described with uniseptate conidia; probably is not a species of the genus *Arthrobotryum.* The first true meliolicolous species are *A. scoparium* P. Hennings from Peru on *Meliola* sp. (*A. soparium,* pro error, in Sacc. Syll., Vol. XVIII, p. 655), and propably also *A. tecomae*

P. Henn. from Peru and *A. strichni* P. Henn. from Brasil, in spite of the fact that no *Meliolae* are indicated in the description.

The genus *Arthrosporium* has been described by Saccardo (Michelia, Vol. II, p. 32. 1880) based on *Arthrobotryum albicans* Saccardo (Michelia, Vol. I, p. 75. 1877). The authentic specimen of the Saccardo's herbarium is very poor; in our opinion is very allied to *Arthrographium stilboideum,* but having slightly greater conidia and light to subhyaline conidiophores. The systematic position of this genus is uncertain: a better knowlegde of the variability and life-cycle of *A. stilboideum* is needed.

The first meliolicolous species is *A. parasiticum* Winter (Hedwigia, Vol. XXV., p. 103. 1886) on *Meliola inermis* from S. Thome. The description is not complete, but the synnemata are fulvous and the conidia very light ochraceous in color.

The genus *Podosporium* has been described by Schweinitz (Syn. Fung. Am. Bor., No. 2609. 1834) on the base of *P. rigidum,* corticicolous fungus and a not clearly recognizable species. Probably the conidiophora are black and black the conidia.

The first meliolicolous species is *P. penicillium* Spegazzini (Bull. Ac. Nac. Ci. Cordoba, N. 471. 1889), previously published as *Meliola penicillata* Speg. (Ann. Soc. Ci. Argent., Vol. XII, n. 117. 1881) on *Meliola calva* in Brasil. It has been described with dull synnemata, but with verruculated-rough tip, and pale smocky conidia.

The genus *Helminthosporiopsis* has been described by Spegazzini (Ann. Soc. Ci. Argent., Vol. X, N. 159. 1880), with a not meliolicolous species: *H. typica* Speg., on rotted stem of an *Eryngium* from Argentina. Apparently is has been discriminated by the conidiophores dull but with hyaline tip. Saccardo (Syll. Fung., Vol. IV, p. 628. 1886) referred this species to *Podosporium spegazzinii* Sacc.

The situation is puzzling and it is cannot be solved without the comparison of authentic specimens or by the study of specimens to be referred to the original species.

To sum up, a tentative interpretation of the meliolicolous and not meliolicolous genera of stilbaceous *Helminthosporia* is referred in the table:

Genus	Meliolicolous	Author	Date	Conidiophores	Conidia
Arthrobotryum	No	Casati	1854	Dull with light tip	Light
Arthrobotryum	? (doubtful)	Berkeley et Curti (doubtful)	1869	Dull	Dull
Arthrobotryum	Yes	P. Hennings	1904	Dull Dull with lighter tip	Dull Dull with lighter end.
Arthrosporium	No	Saccardo	1877	Light	Light

Genus	Meliolicolous	Author	Date	Conidiophores	Conidia
Arthrosporium	Yes	Winter	1886	Halfway	Halfway
Podosporium	No	Schweinitz	1834	Dull	Dull
Podosporium	Yes	Spegazzini	1881 1889	Dull	Halfway
Helminthosporiopsis	No	Spegazzini	1880	Dull with hyaline tip	Dull

Evidently the conidiophores of meliolicolous species are variable from dull or dull with hyaline tip, to halfway, while the conidia are dull to halfway in color. Of the meliolicolous sections of the above quoted genera, the best fitting appears to be the genus *Podosporium*, and we adopted this generic name in expect of better information.

It is possible that the genera *Sporhelminthium* Speg., *Pseudographium* Jacz., *Podosporella* Ell. et Ev. etc. are to be considered here.

A provisional tabulation in key form of the species of the genus *Podosporium* found in the Dominican Republic, together with a few species found in the bibliography, may be:

A) Conidia 2—3-septate only — *P. insularis* Cif.*

AA) Conidia typically 3—4-septate

B) Conidia as a rule 3-septate

C) Conidia to 25—35 μ long

D) Conidia as a rule 25 μ or less in lenght, up to less than 40 μ.

E) Conidia 14—18 μ long; 3—5 μ width — *P. glabroides* (Stev.)*

EE) Conidia 20—25 μ long, 6 μ width — *P. densum* Pat.

DD) Conidia as a rule to 30 μ long

F) Conidia brown; terminal cells from shortly oblong to elongate; synnemata loose, not expanded at the base — *P. effusum* Pat.*

FF) Conidia pale; terminal cells fusoid; synnemata rigid, not expanded at the base — *P. pallidum* Pat.*

FFF) Conidia yellow to pale brown, basal and apical cells paler; synnemata expanded at the base — *P. ugadense* (Hansf.)

DDD) Conidia as a rule to 35 μ long

G) Terminal cells of conidia elliptic, not beaked — *P. penicillatum* (Lév.)*

GG) Conidia with evident beak cells

H) Conidia very beaked; septa more or less equidistant, and cells concolor — *P. caudatum* (Syd.)*

HH) Conidia less beacked; central cells shorter than the terminal and darker

I) Middle cells verruculose (?)

P. melanoplaca (B. et C.)

II) Middle cells smooth

P. consors Sacc.

CC) Conidia 40 μ long or more in lenght

I) Synnemata apically expanded as in a fan-shaped bush

P. dieffenbachiae (Stev.)*

II) Synnemata not or a little expanded at the free end

P. parasiticum Wint. *

BB) Conidia as a rule 4-septate

P. clerodendri (Sacc.)*

CCC) Conidia to 50—80 μ long

P. deightonii (Hansf.)*

AAA) Conidia 2—5-septate

L) Conidia 16—26 μ long

P. strychni (P. Henn.)

LL) Conidia 50—75 μ long

P. penicilloides Karst. et Roum.

AAAA) Conidia 3—7-septate

P. antillanum (Frag. et Cif.) *

The species marked with * are found in the Dominican Republic.

Of course, this is an artificial and provisional key, and may be matter of discussion the discrimination of a so large number of species , chiefly in the group with species having conidia as a rule 3-septate, because primarily based on the lenght of conidia.

P. caudatum (Syd.) n. comb.

Syn.: *Arthrobotryum caudatum* Syd., in De Wild., Fl. Bas et Moy. Congo, An. Mus. Congo, Vol. III, p. 22 (1909).

A species very frequently found in many species of Meliolineae. In the specimen on *Meliola anacardii* Zimm. (on leaves of *Anacardium occidentale*), the coremia are 500—750 μ long, broaded at the free ends, but not fan-shaped, black, with yellowish tip of the conidiophores. The conidia are 38—42 μ long.

P. clerodendri (Sacc.) n. comb.

Syn.: *Podosporium penicillium* Speg. var. *clerodendri* Sacc., Bull. Orto Bot. Napoli, p. 25. 1918.

P. deightonii (Hansf.) n. comb.

Syn.: *Arthrobotryum deightonii* Hansf., I.M.I. Pap.No. 15, p. 218. 1946.

P. dieffenbachiae (Stev.) n. comb.

Syn.: *Arthrobotryum dieffenbachiae* Stev., Bot. Gaz., Vol. LXV, p. 237. 1918.

P. glabroides (Stev.) n. comb.

Syn.: *Arthrobotryum glabroides* Stev., Bot Gaz., Vol. LXV, p. 237. 1918.

On many species of *Meliola* is not unfrequent a *Helminthosporium* more or less correspondent to the true *A. glabroides* [e. g.: on? *Meliola glabroides* Stev., found on *Nectandra coriacea* (Sw.) Griseb., Llano Costero, prov. Santo Domingo, Ciudad Trujillo, Banks of Rio Ozama, 14. XII. 1929, coll. E. L. Ekman (*No. 2749*)].

Previously known in Santo Domingo on *Nectandra antillana,* in a local form (f. *antillanum* Frag. et Cif.) that is, really, another species; see below).

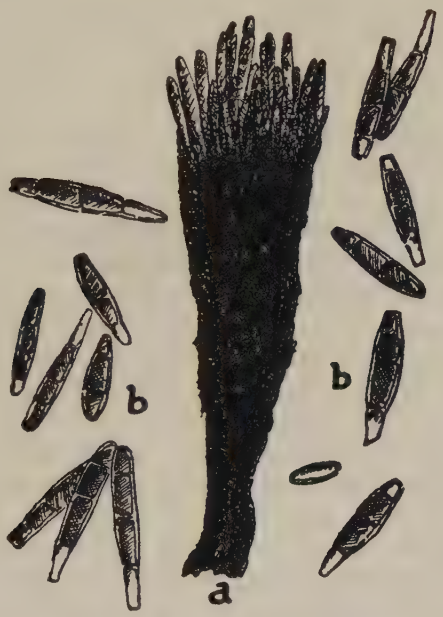

Fig. 5. *Podosporium pallidum* Pat. on *Meliola angusta Stev.:* a) synnema with conidia; b) conidia.

In our opinion *Helminthosporium insigne* Sacc. (Atti Ist. Ven. Trent.-Istr., Vol. X, p. 89, 1917) found on *Meliola insignis* Gaill. on *Mallotus philippinense* in the Philippine Islands, may be the half-aggregated, sub-columnar aspect (arthrobotryoid) of *M. glabroides*; Saccarda himself observed that „ob hyphes conidiophores densiuscule fasciculatis, ad *Podosporium* vergit", and Stevens noted that, on *Meliola comocladiae,* the conidiophores are darker that in the types, sometimes slightly toruloid (in the type specimen often bent but never toruloid) and occasionally there is a strong tendency to be grouped.

For the full description of a typical *A. glabroides,* see Petrak and Sydow (Ann. Myc., Vol XXVII, p. 83. 1929).

P. insularis n. sp.

Maculis nigris, velutinis, indefinitis, hypophyllis; mycelium inconspicuum, brunneum; conidiophoris plus vel minus fasciculatis, flavido-brunneis, erectis, septatis, rectis, variabilibus, pro more 300—350 ⇌ 15—28 μ, apice libero flavidulo; conidiis acrogenis, nigro-fumosis, primo ovoideis, dein elongatis, 2—3-septatis, rarius 4—7-septatis, apice libero truncato, ad septa constrictis, 38—45 ⇌ 10—11 μ, cellulis asymmetricis, superne minoribus, basaliter longioribus.

Hab.: in mycelio vetusto *Meliola* ? vel genus affine, in foliis *Palicoureae,* Reipublica Dominicana.

Found at least once on old, not fructified mycelium of *Meliola* ? or allied genus on leaves of *Palicourea* sp., Republica Dominicana, Cordillera Central, prov. La Vega, Bonao, rain forest, coll. R. C. (without number).

Black, more or less velvety, indefinite, colonies found on the lower pages of the leaf; hyphae inconspicuous or a little evident, brown, with conidiophores more or less fasciculated; conidiophores brown-yellowish, more or less erect, septate, straight or almost so, variable in lenght, as a rule 300—350 by 15—18 μ, with paler free end: conidia smoky-black, at first ovoid, than more elongated, with only 2 or 3 septate (rarely four), with truncate free end, clearly narrowed at the septa, 38—45 μ in lenght at all, 10—11 μ in size, with the cells asymmetric, the superior being smaller than the others, and the basal longer (up to 15—20 μ in lenght).

A species distinct from the allied of the same genus for the 2—3-septate conidia, and the asymmetry of the cells, the apical being shorter and the basal longer.

We suppose that the same species has been found on *Meliola seminata* B. et C. on *Palicourea* in Cuba, by Berkeley (F. cub No. 885), at least following the description of Gaillard (e. c. p. 60), but we dont know the authentic specimen.

P. melanoplaca (Berk. et Curt.) n. comb.

Syn.: *Arthrobotryum melanoplaca* Berk. et Curt., Journ. Linn. Soc. Lond., Vol. X, p. 360 (1869).

The Saccardo's species *P. consors* (from the description) appears to be very allied to *A. melanoplaca* B. et C., as stated by Hansford (I.M.I. Myc., Pap. No. 15, p. 220. 1946, sub *P. concors* instead of *P. consors* and confirmed by Hughes (l. c. p. 4), but the Berkeley and Curtis species (Journ. Linn. Soc. London, Vol. X, p. 360. 1869) has been described with the central, darker cells often granulose to verruculose.

P. penicillatum (Lév.) n. comb.

Syn.: *Meliola* ? *penicillata* Lév., Ann. Sci. Nat. Bot., ser. 9, Vol. V, p. 266. (1846).

See under *P. penicillium.*

P. penicillatum penicillium Speg., Bull. Ac. Nac. Ci. Cordoba, Vol. XI, p. 638. (1899).

Syn.: *Arthrobotryum strychni* P. Henn., Hedwigia, Vol. XLIII, p. 397 (1918).

It may be matter of discussion if it is also identic to *Meliola* ? *penicillata* Lév. (Ann. Sci. Nat. Bot., ser. 3, vol. V, p. 266. 1846) as stated by Seaver and Chardon (Sci. Survey Porto Rico etc., Vol. VIII, 1, p. 102. 1926).

P. strychni (P. Henn.) n. comb.

Syn.: *Arthrobotryum strychni* P. Henn., Hedwigia, Vol. XLIII, p. 297 (1904).

P. ugandense (Hansf.) n. comb.

Syn.: *Arthrobotryum ugandense* Hansf., Proc. Linn. Soc. London, Vol. CLV, p. 65 (1942).

P. antillanum (Frag. et Cif.) n. comb.

Syn.: *Arthrobotryum glabroides* Stev. f. *antillanum* Frag. et Cif., Boll. R. Soc. Esp. Hist. Nat., Vol. XXVIII, p. 141 (1928).

In the original paper we expressed the doubt that this form would be, really, a separate species. This form has been never collected after the first description. The original specimen is quite poor, but we suspect, now that two different species are present in the same spot.

It is possible that the conidia 3—4-septata, asymmetric, obtuse-conoidal, 25—42 by 6—10 μ are pertaining to one species; the conidia symmetric, lenghtened, almost caudate, 5—7-septate, 40—70 by 7—11 μ are to be referred to another species.

This specimen has not been collected by ourselves, but by Dr. Chardon. In conclusion this new combination is doubtfull.

3) On the genera *Sarcinella* Sacc. (Mycelia sterilia) and *Mitteriella* Syd. (Fig. 1).

Forms of this genus are not infrequently found in the Dominican Republic, and about twenty years ago we had the opportunity to compare a number of extra-antillean specimens for the kindness of the late Dr. H. Sydow and to the previous Curator of the Saccardo's Herbarium in Padua, Prof. Gola, including the type specimens.

The genus *Sarcinella* (type *S. heterospora* Sacc.) has been described by Saccardo (Myc. Ven., No. 153—154; Michelia, Vol. I, p. 18. 1877; Vol. II, p. 31. 1880. F. Ital. tab. 126) for a fungus considered to be connected, as conidial stage, to *Dimerosporium pulchrum* Sacc., with two types of conidia: one black or blackish, sarciniform, and the other hyaline and phragmosporeous. This species has been found

many time in Europe (Italy, Switzerland, Germany) and North America, but apparently never in the tropical regions. Other species described were: *S. milletiae* Syd. (Ann. Mycol., Vol. XXV, p. 151. 1927); *S. oreophila* Syd. (Ibid., Vol. XXXVI, p. 242. 1927); *S. tandonii* Mitter (Ibid., Vol. XXXV, p. 243. 1927); *S. acalyphae* Syd. (Ibid., Vol. XXVIII, p. 219. 1930).

In addition *Coniothecium questieri* Desm. has been referred by Arnaud (Ann. Sc. Nat. Agr. Montpellier, N. S., Vol. XVI, p. 88. 1918; see also v. Höhnel in Weese Centr. f. Bakt., II Abth., Vol. 60, p. 23. 1924) to the genus *Sarcinella*.

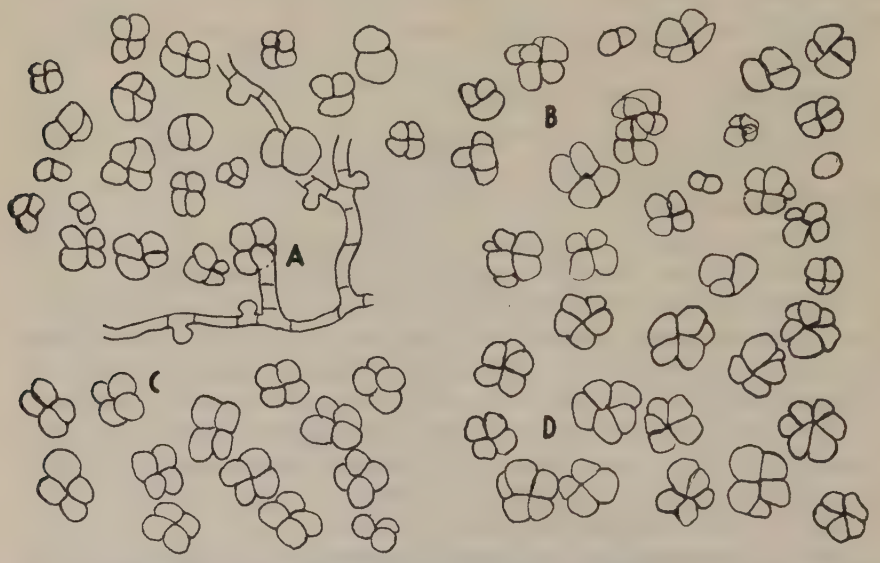

Fig. 7. *Sarcinella*. A. Sarcinopodia with mycelic hyphae of *S. heterospora*. B. Sarcinopodia of *S. acalyphae*. C. Sarcinopodia of *S. raimundi*. D. Sarcinopodia of *S. milleriae*.

The dominican specimens are allways associated with undeveloped Ascomycetes, with the only exception of a specimen on *Schiffnerula domingensis* Petr. et Cif. (Ann. Mycol., Vol. XXVIII, p. 400. 1930), but on this specimen the *Sarcinella* is well developed only when the *Schiffnerula* is immature and in the empty parenchymatous stage. The other specimens were undetermined, being, probably, species of *Schiffnerula* or *Questiera*, even *Clypeolella* or allied fungi.

In our opinion, the so called sarciniform conidia are only a superior, morphologically evolutive stage of capitate hyphopodia, here called sarcinopodia, as a rule developing from a simple, enlarged stigmopodium; apparently only a few, normal stigmopodia are capable to evolve to sarcinopodia. This aspect is distinct from other hyphopodia because, as a rule, they are acrogenous and found

on the top of a small branch of the hypha, in spite of the fact that sessile sarcinopodia are frequent. The modality of development is quite variable; in most cases, at first a bipartite cell, forming a double hemisphere, with a central, more and more differentiate septum, is evident; in a few cases, the cell is not septate or it is tripartite. The other cells are formed centrifugally by one or more proliferation of the hyphal tip, as a rule by one. The mature sarcinopodia are isolated, with or without a fragment of the mother hypha.

The signification of the sarcinopodia is unknown; we never observed the germination even not the first beginning. They are not conidia in true sense, nor chlamydospores: in the sarcinopodia, as a rule, the septa formation is more or less contemporaneous to its development, while in the thallospores the septa formation is posterior to the development.

In our opinion, the sarcinopodium is an upper evolutive stage of a hyphopodium. In the scale of the morphological complexity, we found, at first the simple, scattered, poor differentiated, as a rule rounded hyphopodia; then the simple hyphopodia, but differentiated in capitate and mucronate, without evident basal cell; then differentiated, biform hyphopodia with an evident, basal cell and a lobed antrorse, incise, etc. head cell; at last the more complex sarcinopodia.

It is well possible also that the signification is that of bulbil-like form of hyphopodia. Arnaud (l. c.; also pl. XLI, fig. E—J) in relation to *Questieria* and *Coniothecium questierii* Desm. (Pl. Crypt., XVI, p. 798. 1887) wrote that they are „des jeunes ascostromes dont les cellules onts été évolué en chlamydospores", a not clear statement; in any case they are different from the true bulbils as described, e. g., by Vincens (C. R. Acad. Sci. Paris, CLXIII, p. 572. 1916) for *Melanospora.*

More recently Arnaud published the combination *Questierella raimundi* (Sacc.) Arn. (Bull. Soc. Myc. France, Vol. LXIX, p. 284. 1953) for *Sarcinella raimundi* Sacc. p. p., for the conidial, noth the bulbillar stage, a genus apparently not truly justified.

If the sarcinopodia are bulbilear organs, a morphological evolutive scale may be traced starting from the pluriseptate chlamydospores of many genera of Hyphales (chiefly Dematiaceae in culture), to the 1—6-septate sarcinopodia of *Sarcinella heterospora,* to the up 20-septate sarcinopodia of *S. oreophila,* ending to the multiple and complex bulbilar of sporidesmioid type, as in *Papulospora* and allied genera.

The comparison of a number of specimens yielded the following data:

Sarcinella heterospora Sacc.

f. ligustri D. Sacc. in foliis *Ligustri vulgaris,* Aug. 1903. Montello, Treviso. D. Sacc., Myc. Ital. *No. 1396.*

Black, diffuse, undelimitate, ampligenous spots. A poor specimen.

No. of cells	1	2	3	4	5	
Frequency	1	3	8	35	3	= 50

Diam. of sarcinopodia: from 20 to 38 μ, chiefly 22—35 μ.

Sarcinella heterospora Sacc.

f. *corni* D. Sacc. As above *No. 1395.*

Black, diffuse, undelimitate spots.

No. of cells	2	3	4	5	6	
Frequency	3	5	11	27	4	= 50

Diam. of sarcinopodia: from 23 to 40 μ, chiefly 24—36 μ.

Sarcinella heterospora Sacc.

in foliis siccis *Ligustri.* Torre d'Isola, Pavia, without data. Leg. G. Briosi (Myc. Horti Bot. Paviae).

Blackish to black-brownish, definite, roundish spots, chiefly on the upper page.

No. of cells	1	2	3	4	5	6
Frequency	1	3	6	33	5	2

Diam. of sarcinopodia: from 19 to 35 μ; ciefly 21—25 μ.

Sarcinella heterospora Sacc.

In foliis vivis *Fraxini* sp., Beaumont, Texas, Am. bor., Nov. 1889, leg. Dr. B. F. G. Egeling in Ell. et Ev. N. Am. Fungi, *No. 2685* (fide cl. Auct. socia *Dimeriospori pulchri* Sacc.).

Or the upper surface of the leaf, forming black, diffuse, microthyriaceous colonies; in the lower page colonies black, confluent, cladosporiaceous.

No. of cells	2	3	4	5	
	2	7	40	1	= 50

Diam. of sarcinopodia: from 22 to 36 μ, chiefly 28—31 μ.

Sarcinella heterospora Sacc.

in foliis vivis *Ligustri vulgari,* Montello, Treviso, without data, leg. P. A. Saccardo (type specimen).

No. of cells	1	2	3	4	5	6	
Frequency	1	2	10	26	8	3	= 50

Diam. of sarcinopodia: from 18 to 32 μ, chiefly 20—26 μ.

In this poor specimen the *Dimerosporium pulchrum* Sacc., if any, is very little developed and unrecognizable. Also the species with hyaline, phragnospore conidia is not evident.

Sarcinella heterospora Sacc.

Rodero, Como, leg. O. Mattirolo, Oct. 1898 (ex Herb. Horti Bot. Patavini).

Colonies subcrustose, black or blackish, dense, covering most of the leaf surface.

No. of cells	1	2	3	4	5	6	
Frequency	1	3	7	33	3	3	= 50

Diam. of sarcinopodia: from 20 to 34 μ, chiefly 25—30 μ.

Sarcinella heterospora Sacc.

Ad *Ligustri vulgaris* folia viva, prope Zürich, Helvetiae, Oct. 1880, leg. G. Winter (Rabenh. Wint., F. europaei, *No. 2684*) (ex Herb. O. Pazschke).

Small, amphigenous, black, subcrustaceous spots.

No. of cells	2	3	4	5	6	
Frequency	8	9	28	4	1	= 50

Diam. of sarcinospodia: from 21 to 37 μ, ciefly 22—28 μ.

Sarcinella acalyphae Sydow (type specimen).

Spots black, amphigenous, fumarioid, effuse, almost indelimitate.

No. of cells	1	2	3	4	5	6	7	
Frequency	1	3	8	16	14	7	1	= 50

Diam. of sarcinopodia: from 21 up to 32 μ; chiefly 25—29 μ.

Sarcinella milleriae Sydow (type specimen).

Spots blackish; irregularly distributed and irregular, effuse to delimitate.

No. of cells	3	4	5	6	
Frequency	2	12	25	11	= 50

Diam. of sarcinopodia: from 22 to 36 μ, chiefly 28—31 μ.

Sarcinella raimundi Sacc. (type specimen).

in foliis *Solani melongenae*, Morong Valley, Luzon, Ins. Philipp., 8. II. 1913, leg. M. B. Raimundo, *No. 2016* (in Herb. Horti Bot. Patavini).

Superficial, a little visible spots, subdiffuse up to confluent, rarely single, covering most of the surface of the leaf.

No. of cells	3	4	5	6	7	8	
Frequency	4	6	7	23	7	3	= 50

Diam. of sarcinopodia: from 30 to 38 μ, chiefly 32—36 μ.

Sarcinella oreophila Sydow.

Specimen unknown to us; from the description this species appears to be distinct from the other for the kinds of „oidia" : smaller, 4—6-cellular, and greater up to 20-cellular.

Sarcinella tandonii Mitter.

As above; from the description, apparently allied to the preceding.

Sarcinella ancoche Speg.

As above; from the description, apparently a species, very allied to *S. heterospora,* and differing chiefly for the slightly greater sarcinopodia.

Sarcinella questieri (Desm.) Arn.

It has been studied on a poor specimen, cotype, according Arnaud (l. c.) of *Questiera pulchra* (Sacc.) Arn. var. *corni-sanguinei* Sacc. (under *Apiosporium pulchrum* Sacc. f. *corni-sanguinei* Sacc.; Myc. Ven. *No. 154,* Selva, Treviso, Sept. 1874). The mycelium is branched, also to a right angle, more frequently irregularly branched, yellowish-brown to dull-brown, 2.5—3.5 μ diam.; normal hyphopodia allways sessile, more or less spheric or ovoid or elliptic, irregularly distributed, alternate or unilateral, rarely opposite, 3—6.5 μ diam. or 4—7 ⇌ 2—6 μ; sarcinopodia as a rule 4-cellular, rarely 3- or 5-cellular, tetragonous, rarely sub-trigonous up to pentagonous, with the rounded borders, at first yellow-brownish then brown and, at last, very dull-brown, as a rule 20—25 μ diam.

From the morphological standpoint, it is not distinct from *S. heterospora,* having priority on the last named species, to which is to be reported as synonim.

The conclusion is that the sarcinopodia are notably homogeneous, and, in absence of the corresponding fructiferous stages, *S. acalyphae* Syd., *S. millerii* Syd. and *S. raimundii* Sacc. (and probably *S. ancoche* Speg.) cannot be differentiated from *S. questieri* (= *S. heterospora* Sacc.). According the description, *S. oreophila* Syd. (including ? *S. tandonii* Mitter) is distinct on the account of sarcinopodia up to 20-cellular.

The genus is to be placed amongs the group of Mycelia sterilia (Agonomycetes).

In conclusion, we have:

A) Sarcinopodia 1—7-cellular, as a rule 4—5-cellular:

Sarcinella questieri (Desm.) v. H. = *S. heterospora* Sacc.; = *S. acalyphae* Syd.; = *S. millerii* Syd.; = *S. raimundii* Syd.; = ? *S. ancoche* Speg.

AA) ? Sarcinopodia up to 20-cellular:

S. oreophila Syd. (? with *S. tandonii* Mitter).

In the specimen of *S. raimundii* we found many sterile stromata, and also brown, nonseptate conidia, of 20—23 by 9,5—11 μ, similar to an imperfect form of an Asterinea (*Asterostomella* or an allied genus).

The specimen of *S. milleriae* harboured also the *Phaeodimeriella asperula* Syd. with the imperfect stage of *Cicinnobella asperula* Syd.

No mature ascosporic fungi were found in the other specimens.

Associated with *Sarcinella* we found a number of Hyphales, as a rule superposed and not easily recognizable. Yet in the type specimen of *S. heterospora* two forms were recognized, one Moniliaceous fungus with 3-septate, hyaline conidia, fusate to cylindric 25—30 by 10—12 μ, is found, and a second Moniliaceous fungus but with unseptate, hyaline, spheric to ovoid or elliptic conidia, as a rule 6 by 3 μ. The specimen studied by ourselves was too poor for the determination of these species. Associated with *S. oreophila* another fungus has been shortly described by S y d o w (Ann. Mycol., Vol. XXXV, p. 243. 1947) as parasitic, with brown, unseptate, rounded and regular, conidia 7—10 μ diam. and hyaline, septate mycelium, 3—4,5 μ diam.

In the specimen of *S. raimundii*, while the sarcinopodia are scare, a Hyphales is found frequent and abundant; it has been shortly described by S a c c a r d o himself; the mycelium and conidiophore are not evident; the conidia are fusarioid in shape, slightly curved, acutate at the free end, and acutate-obtusate at the basal end, at first hyaline or subhyaline, then brown, with 3 septa almost equidistant, slightly narrowed near the septa 22—30 by 8—11 μ, as a rule 24—24 by 9 μ, with the two central locules dull-brown to blackish, and the apical and basal lighter to subhyaline. A mycelium (of this species?) hyaline, septate, sparingly branched, of 1,5 μ in thickness, is present.

(Also a few conidia cylindroid to spindle-shaped 3-septate, as a rule 18 by 4—5 μ, yellowish to brownish, evidently of another species, are present).

In addition to typical, ascomyceticolous *Helminthosporium* spp., we found at least two times a species with hyaline or yellowish, septate, irregularly but sparingly branched mycelium, having undifferentiated short conidiophora of the same color to light-brown, and acrogenous or acropleurogenous, single and scattered conidia, elliptic to ovate, with both ends rounded or the basal end rounded-truncate, at first hyaline and unseptate, then with one or, more frequently, 2 septa, at maturity dull-brown; the septum may be more or less central but, if two septa are present, the central cell is longer and darker than the basal and the apical ones; in many cases the shade of the three cells is more or less the same, but also the apical end is lighter to almost hyaline, and prolungated in a kind of short, apical appendix, also lighter to subhyaline, 2—5 μ in bright and 1—3 μ thick (almost a thick, light seta) formed by an extrusion of the conidial episporium; the size of the conidia is 22—30 by 12—18 μ.

Also H a n s f o r d (I.M.I. Pap.No. 15, p. 27—29. 1946) recorded a conidial stage of *Schiffnerula,* shortly describing also conidia (on *S. mirabilis* v. H.) of the falcate type, 30—40 by 10—13 μ, conidia [on *S. radians* (Syd.) Petr.] falcate, pale olivaceous, then darker, 3-septate, not or slightly constricted, 50 by 11 μ, tip abruptly rounded, „base ending in a flat hilum", and *„Helminthosporium"* conidia (with short, scarcely differentiated, repent, 1-septate conidiophores) colored, usually 3-septate, with central cell darker than the end cells and sometimes much larger than the latter, as shown is *Mitteriella zizi-phina* Syd. The last fungus appears to be allied to the species found with *S. raimundi.*

Our conidial fungus is to be referred to the genus *Mitteriella* Syd. and apparently identic with *M. zizyphina* Syd. (Ann. Mycol., Vol. XXXI, p. 95. 1933), found in India and described as conidial stage of *Schiffnerula* or other Englerulaceae. In our opinion the genus is one the many, helminthosporioidal, ascomyceticolous, tropical fungi It is well characterized, but we dont agree in considerating it as an imperfect form of the Englerulaceae. According our observation, the hyphopodiate mycelium is that of the Ascomycetes, while the mycelium of *Mitteriella* is characterized by a simple, common hyphae; it is true that the hyphomycetic mycelium is poorly developed and not easily recognizable, in contrast the hyphopodiate mycelium of Englerulaceous, undeveloped fungus. The Dominican specimen has been found on the old mycelium of an Englerulaceous fungus (Dominican Republic, Valle del Cibao near La Cumbre, X. 1929, without number and name of the collector.

The fungus with falcate, 3-septate conidia with darker central cells described by Saccardo and by Hansford appears to be one the very many, pauciseptate *Helminthosporium*-like, tropical fungi, found on or together with foliicolous Ascomycetes, but without metagenetical connection with the same group of fungi.

4) On the genera *Spegazzinia* Sacc. and *Isthmospora* Stev.

Species of the genus *Spegazzinia* and *Isthmospora* are frequently found on leaves of plants harbouring foliicolous Ascomycetes, but it is unusual to observe well developed, complete specimens.

The nomenclature has been established both by Sydow (Ann. Mycol., Vol. XVIII, p. 187. 1921) and by Hansford (I.M.I. Myc. Pap., No. 15, p. 220. 1946), reducing to synonimy of *S. meliolae* Zimm. (Centr. f. Bakter, II Abth., Vol. VIII, p. 221. 1902) the species: *Isthmospora glabra* Stev., *Spegazzinia meliolicola* P. Henn., *Tetrachia singularis* Sacc., and probably *Stemphylium muriculatum* Sacc. and *Spegazzinia coffeae* P. Henn.

An excellent monographic revision of the regretted, late Dr. Damon (Bull. Torrey Bot. Club, Vol. LXXX, p. 155—165. 1953) accepted two species, each one for the genera *Spegazzinia* and *Isthmospora;* namely: *Spegazzinia tessarthra* (B. et C.) Sacc. (= *Sporidesmium tessarthrum* B. et C.; = *Spegazzinia ornata* Sacc.; = *S. tucumanensis* Speg.; = *Tetrachia quadrigemina* B. et C.; = *Triposporium cristatum* Pat.; = *Spegazzinia brasiliensis* Speg.) and *Isthmospora trichophila* (Atk.) Damon (= *Spegazzinia trichophila* Atk.; = *S. meliolae* Zimm.; = *S. meliolicola* P. Henn.; = *S. coffeae* P. Henn.; = ? *Tetrachia singularis* Sacc.; = ? *Stemphylium muriculatum* Sacc.; = *Isthmospora spinosa* Stevens). Other species of *Spegazzinia* (*S. effusa* Karst., *S. lobata* v. H., *S. calyptospora* v. H., *S. ammophila* Rostr. and *S. rubra* Dearness et House) are excluded from this genus.

Almost simultaneously Hughes (I.M.I. Myc., Pap. No. 50, p. 77—97. 1953) published, under *Trichothyrium,* a very good study on developmental morphology of the "isthmospores". Agreeing with Damon's conclusion on the indipendence of the *Spegazzinia* and *Isthmospora,* both genera are considered as conidial stage of *Trichothyrium.* To *Trichothyrium asterophorum* (Berk. et Br.) v. H. are referred *Isthmospora spinosa* Stev., *Stemphylium muriculatum* Sacc., *Tetrachia singularis* Sacc. and, doubtfully, *Spegazzinia meliolae* Zimm., *S. meliolicola* P. Henn. and *S. coffeae* P. Henn.; to *T. reptans* (Berk. et Curt.) Hughes are referred *Isthmospora glabra* Stev. and *Spegazzinia chandleri* Hansf. (The reference of *Hansfordiella meliolae* (Hansf.) Hughes [= *Teratospermum meliolae* Hansf.] to *T. hansfordii* Hughes is not interesting to our purposes).

We cannot agree with the methagenetical linkage of *Spegazzinia* and *Isthmospora* with *Trichothyrium*. The species of the genus *Trichothyrium* are overgrowing by meliolicolous fungi (as well as asterinaceous and allied species), very frequently in Neotropical fungine flora, but — at least in our experience — rarely on well developed, full fructified specimens. In most case there are a suspicion of *Trichothyrium* for a more or less rudimental development of a sterile thyrothecium. While the association of *Trichothyrium* with *Spegazzinia* and/or *Isthmospora* is very frequent, it is possible to see "isthmospores" on Meliolaceous fungi without any thyriothecium, and — rarely — also full mature and fructified species of *Trichothyrium* without *Spegazzinia* and/or *Isthmospora*. Hughes himself listing 39 specimens of *Trichothyrium asterophorum*, only in 4 observed both thyrothecia and "isthmospores".

In conclusion, in our opinion the presence of *Spegazzinia-Isthmospora* together with trichothyriaceous fungi is one aspect of the multiple association of fungi in the same leaf, even the same spot. These associations (with a more or less evidence of antagonistic, not truly parasitic effect) is of very common occurence in the Neotropical fungine flora of the mesophytic, rain and mountain forests, chiefly in West Indies and Central America. The late Dr. Sydow told me that he found in Costa Rica up to 8 meliolicolous fungi in the same spot (5 of which were identified), and we found up to 6 in the Dominican Republic.

From the historical standpoint, we must remember that in the beginning of study of tropical microfungi, members of Dematiaceous fungi were considerated as conidial stage of folliicolous Ascomycetes. Yet in the well known Gaillard's monograph of *Meliolae*, species of *Helminthosporium* (and of the stilbaceous forms of *Helminthosporia*) were regarded as conidial stages of *Meliolae*.

In one case at least we demonstrated the indipendence of the *Helminthosporium* from the ascomycetous fungi, easily cultivating in artificial, laboratory media *H. hurae* Syd., that Arnaud considered as conidial stage of *Parodiopsis perae* Arn. (see Ciferri, Ann. Mycol., Vol. XXIX, p. 292. 1931).

At last, three genera of imperfect, conidial stages for the same genus of Ascomycetes, is an unusual record.

We never observed the abscision of the "isthmospores" in several portions, as in Hughes (p. 46) but allways (and rarely) in two bicellular conidia. Also the observation "ex natura" of the germination of a composed conidium is, apparently, rare: only once we observed two short germinating hyphae starting from two, diametrically opposite side of a composed conidium of *Isthmospora spinosa*, without abscission of the two bicellular conidia.

Stemphylium muriculatum has been described by Saccardo (Atti Acc. Veneto-Trentino, Vol. X, p. 86. 1917) on *Meliola lepisanthea* on leaves of *Lepisanthus*, in the Philippine Islands.

A reexamination of the authentic specimen (in Herb. Sacc.) demonstrated that this species is strictly allied to *Spegazzinia*, but it has been placed in the genus *Stemphylium* probably on account at the loose fructification, in opposition to the compact aggregation of

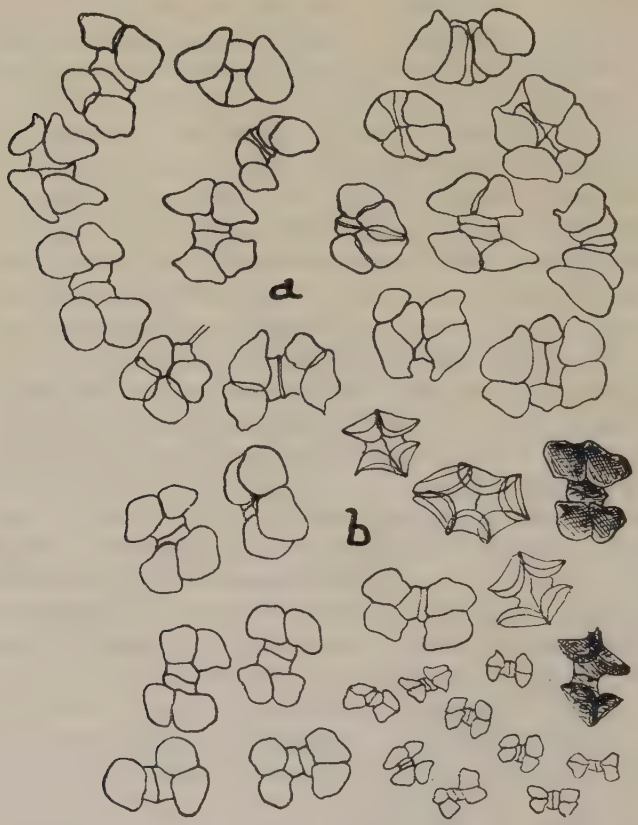

Fig. 8. *Isthmospora glabra* Stev.: a) conidia from the type specimen; b) conidia from the Dominican specimen.

Spegazzinia. But in spite of the fact that the typical fructifications of *Spegazzinia* are also almost sporodochial, on species of this genus (frequent in tropical *Meliolae* and other foliicolous Ascomycetes) any intermediate stage from the loose to the compact fructification may be easily observed. (The same condition may be observed from the stilbaceous coremia of *Podosporium* [*Arthrobotryum*] to the loose aspect of meliolicolous *Helminthosporium*).

We confirmate, then, that *Stemphylium muriculatum* is to be placed as synonym of *Spegazzinia meliolae* A. Zimm. (Centr. f. Bakt., II. Abt., Vol. VIII, p. 221. 1902), found on *Meliola anacardi* (Java) and on *M.* ? *ambigua* (India), but frequent on *Meliolae* of the tropical New World, as observed by Hansford (I.M.I. Myc. Pap., N. 15, p. 221. 1946), under *Trichothyrium asterophorum* (B. et B.) v. H. according Hughes ibid., N. 50, p. 78. 1953).

For the courtesy of the late Dr. F. L. Stevens, about twenty years ago, we obtained a fragment of the type specimen of *I. glabra* Stev. (on *Meliola glabroides* Stev. on leaf of *Nectandra patens,* Puerto Rico, *No. 8973*), apparently considered by the complaint student of fungi as the type specimen, in spite of the fact that in the publication of the species (Bot. Gaz., Vol. LXV, p. 244. 1918) it has been quoted as the fourth specimen. The *Meliola* is densely overgrown by a series of fungi, a *Trichothyrium* at first, then many Hyphales, one of which is *Isthmospora.*

Mycelium and conidiophores are uncognizable; the conidia are very variable but typically constituted by two couples of smooth cells, more or less symmetric, connected by a kind of isthmus. as a rule shorter and narrow than the cells. Each pair of cells may be considered, at the best, by two cells with one central septum. Together with the isthmus — and rarely also appended to one cell — another, obconic cell is present, in many cases connected with a fragment of the mother hypha, as a short sterigma. The upper portion of the cells are frequently apiculated (rarely the lower part) and always irregularly. The isthmus may be not septate or longitudinally septate; if it is long as the lateral cells, it may be subdivided by two transversal septa, and, in this case, 4 transversal and one longitudinal septa are present. This morphology is evident only to a front view; by lateral or transversal views the aspect is strange and variable, and much more if the conidia are aggregated in two or three.

It is possible that *Isthmospora glabra* and possibly *Spegazzinia chandleri*; see below) is to be attributed to a separate genus, as stated also by Damon; but it would be necessary a better knowledge of the developmental morphology and of the germination. In any case it may be attributed better to the group *Titea-Aorate* than to *Spegazzinia-Isthmospora,* the first group having a much more complex and variable morphology then the latter.

The morphology of *Isthmospora spinosa* Stev. (studied on a specimen send by F. L. Stevens, on *Meliola psidii* Fr. on *Psidium guajava,* Puerto Rico, Yauco, No. 3120, type specimen) is allied but simpler, and very coincident with Sydow's redescription of *Tetrachia singularis* Sacc. It has been observed many times in Dominican specimens but sparingly and confusely, the spots being overgrown

by fungi. The morphology, as rule, agree well with Stevens' type specimen, and we agree with Damon's conclusions.

While *S. meliolae* is of the general type of an aggregated *Epicoccum* (and in *E. granulatum* Penz. there are some tendency to phaeophragmious conidia), very rough (in general prominently echinulated to spiny), the morphology of the glabrous *Isthmospora glabra* is more complex and variable. But a real comparison would be made on a developmental study of the conidia, up to-now particularly made only by Hughes. In the meantime, it seems best to me to retain the genus *Isthmospora* for the species with glabrous conidia with a large isthmus and without tendency to the formation of sporodochia (namely, of the Moniliaceous family), and the genus *Spegazzinia* for the species with rough conidia, a more or less indistinct isthmus and the tendency to aggregate in sporodochial forms, in addition to the morphological difference of the conidia. This is in agreement with Damon's statement.

At least from the description (and the fig. 48 of Hughes) *S. chandleri* Hansf. (Proc. Linn. Soc. Lond., Vol. CLV, p. 62. 1943) is a species of a genus different both from *Spegazzinia* and *Isthmospora,* and allied to *Isthmospora glabra,* as stated by Hansford in the year 1946. In any case, it is more allied to *Titaea-Aorate* than to *Spegazzinia.*

In a specimen of *Meliola banarae caseariae (No. 33313*; see our revision of the Dominican *Meliolae*) we found a number of conidia of the *Spegazzinia* type, with four black cells and a little evident isthmus, muriculate to spinulose, tetrangular-rounded and narrowed following two cross lines, up to almost rounded (and then not or very little narrowed), having on average of 40 μ in diam., namely, more than the double of *S. meliolae.* It may be another species of the same genus, but it was densely overgrown by a mucedinaceous fungus with fusoid to ovate-oblong, 1- to 3-septate conidia, as a rule 12—14 by 6—7 μ, apparently a small-spored species of the genus *Eriomycopsis.*

Recently Arnaud (Bull. Soc. Myc. France, Vol. LXIX, p. 294. 1953) shortly described the genus *Cartosia,* as *C. meliolae* (Zimm.) Arn. for *Spegazzinia meliolae* Zimm., for the sessile „bulbils" in opposition to the long-stalked conidia of *Spegazzinia.* In our experience, the conidiophores of *Spegazzinia* are very variable from long (and simple), straight or sinuose, to very short or almost lacking, being reduced to a short papilla on the mother hypha. We see no reason for the subdivision of *Spegazzinia* in two genera following this characteristic.

A few words about the genus *Hansfordiella.* At least in our collection, this genus is of exceptional occurrence in Santo Domingo.

We observed a few times scattered conidia of the shape of the conidiophora and conidium of *H. meliolae* (Hansf.) Hughes, on leaves harbouring Meliolaceous fungi, but never well developed colonies.

5) **Acremoniella melioliphila** Cf., n. sp. and a tentative subdivision of the genus *Acremoniella.*

Acremoniella melioliphila Cif., n. sp.

Parasitica in *Meliola*; coloniis fungorum nigris, velutinis, quasi fumagoideis vel quasi-asterinoideis, 0,5—2 mm diam.; mycelio delicato, hyalino, parce ramoso; conidiophoris (aleurophoris) hyalinis, 1—2 μ diam., longitudine variabilibus, irregulariter multiramosis; conidiis (aleuriis) acrogenis, singulis, nigris, opacis, sphaericis vel pyriformibus, 7,5—9,5 μ diam. vel 8—11 ⇌ 7—9 μ.

Hab.: cum *Meliolae swieteniae* Cif., Llano Costero, prov. Santo Domingo, Ciudad Trujillo, banks of Rio Ozama, 14. XII. 1929, leg. E. L. Ekman (*No. 2739*); cum *Meliolae tonkinensis* Karst. et Roum. var. *cecropiae* Stev., loc. plur., 15. XII. 1929, leg. Id. (*No. 2795*).

Parasitized colonies of *Meliola,* black, velvety, irregular, mostly confluent, of an asteroid-subfumagoid type, often star-like, small (0,5—2 mm diam.); colonies of the *Acremoniella* may also occur seemingly indipendent from the *Meliola,* and sometimes even on the lower surface of the leaf. Mycelic hyphae very thin, hyaline, sparingly branched. Conidiophores (aleuriophores) indistinctly septate, hyaline, 1—2 μ, as a rule 1,5 μ in thickness, very variable in lenght, many times and irregularly branched, prostrate, each branch producing only one conidium. Conidia (aleuria) acrogenous, single, completely black and opaque, spheric to pyriform, normally 7,5—9,5 μ in diam. or 8—11 by 7—9 μ, with an indistinct epispore. (Young conidia are light brown with the epispore outlined in black). If, as often happens, the conidiophores are repeatedly branched, and the branches short, closely approximate and like sterigmata, the fructification appears to be pseudoracemose, but not truly racemose. Phialospores not observed.

An interesting new species, characterized primarily by the peculiar habitat, differing from the symbiotic species *A. sarcinellae* Pat. et Har. (Journ. Bot., Vol. XIV, p. 245. 1900; see also Hansford, I. M. I. Myc. Pap., N. 15, p. 213. 1946).

Ciferi and Ashford (Mycologia, Vol. XXII, p. 67. 1930) subdivided this genus in *Eu-Acremoniella* with conidiophores (aleuriophores) erect, and *Acremoniellopsis* with prostrate conidiophores. Not considerating here phialophores and phialides, as a rule lacking in uncultivated samples (see Mason, I. M. I. Pap. 3, p. 29—39. 1933), a more complete, subgeneric division may be:

A) Mature conidia with an appendage (part of the sterigma) *Caudacremoniella* (type: *A. sarcinellae* Pat. et Har.).

AA) Mature conidia without residual portion of the sterigma.

B) Conidia smooth; conidiophores ramose or scarcely so.

C) Conidiophores prostrate, profusely irregularly, ramose: *Acremoniellopsis* (type *A. atra* (Cda.) Sacc.; lectotype: *A. olivaespora* Cif. et Ashf.).

CC) Conidiophores more or less erect, not sparingly ramose: *Eu-Acremoniella* (type: *A. cucurbitae* Schulz. et. Sacc.).

BB) Conidia verrucose; conidiophores regularly ramose: *Spinacremoniella* (type: *A. verrucosa* Togn.).

Caudacremoniella n. subg. Conidia (aleurosporia) matura levia, hypharum appendiculata.

Spinacremoniella n. subgen. Conidia (aleurosporia) non appendiculata, verruculosa.

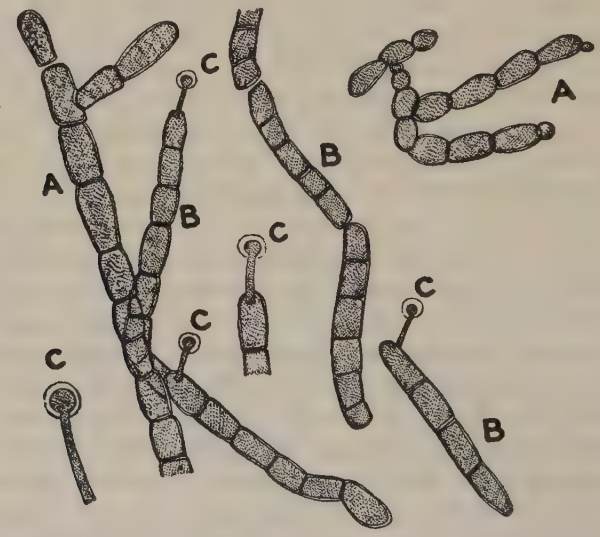

Fig. 8. *Grallaeomyces portoricensis* Stev.: A. Young budding mycelium. B. Old mycelium with holdfast organs. C. Details of the last organs.

In conclusion, we are not sure that the conidia of all the species of *Acremoniella,* with exception of the subg. *Caudacremoniella,* are really aleuriae.

The assimilation of *Allescheriella* P. Henn. as subgenus of *Acremoniella* (see Ciferri and Baldacci, Atti Ist. Bot. Univ. Pavia, serie IV, Vol. VII, p. 337. 1946) after the revision made by Linder is not justified, *Allescheriella* being synonim of *Rhinotrichum* Corda; in addition, apparently, the conidiophores (aleuriophores) are from hyaline to yellowish or light-brown, never black as in all the species of the genus *Acremoniella.*

6) *Grallaeomyces portoricensis* Stev. (Fig. 2).

This fungus has been described by Stevens (Bot. Gaz., Vol. LXV, pag. 245. 1918) as *Grallomyces portoricensis* (spelling corrected in *Grallaeomyces* by the late Author in lett. dated Oct. the 1th, 1931) on leaves of nine host species in Puerto Rico, very often associated with *Meliolae.*

We found the same fungus in many dominican specimens, as a rule growing together with species of the genus *Meliola,* but allways incompletely developed, and we compared the dominican specimens with the type specimen (on *Clusia minor*), kindly sent by the regretted, north american botanist.

Also in the Puerto Rican specimen, the true mycelium is composed by irregular chain of cells, dark-brown in color, irregular in shape as well as in size, as a rule elliptic-truncate or ellipsoid to cylindric (also spheric if smaller), averaging 15—19 by 8—10 μ. The bodies described by Stevens as „links composed of usually 4 or 5 cells each", with same constriction at the septa are, in our opinion, a kind of composed chlamydospores, cylindric-elongated, thin, brown-blackish in color, 5 to 6 septate, very slightly constricted at the septa, as a rule of 100—134 by 14—18 μ, and frequently arranged at „zigzag" („rail fence") appearance. Not rarely the chlamydospore is much shorter and only 1—2-septate. Each composed, pluriseptate chlamydospore is more or less narrowed at both ends (but frequently very little narrowed), and producing a branch at right to acute angle with the chlamydospore. This branchlet („stilt" in the Stevens' nomenclature) is up to 26—30 μ in lenght, 2—3 (even less) μ wide, and possess, at the free end, a sphaeric, more or less diaphanous enlargement, as a rule 13—14 μ in diam. The interpretation of Stevens as a holdfast organ is, probably, correct; it appears to be an adhesive organs on the mycelium of the *Meliolae* or on the leaf surface.

The genus *Grallaeomyces* appears, then, to be a member of the group of Mycelia sterilia (Adelomycetes), but the affinities are doubtful.

The most typical, dominican specimen, has been found on *Meliola amomicola* Stev., Cordillera Central, prov. Santo Domingo, Villa Altagracia, 7. I. 1930, coll. E. L. Ekman (*No. 2860*).

7) **Fusarium dominicanum** Cif., n. sp.

Mycelio albido, laxo, mycelio *Meliolae* intermixto; conidiophoris hyalinis, rectis, simplicibus, plus vel minus aggregatis, septatis, brevibus, 5—7 μ crassis; conidiis singulis, acrogenis, leviter falcatis usque rectis (etiam uncinatis), 3—4-septatis, etiam 4—8 septatis, 87—94 ⇌ 5—7 μ usque 93—107 ⇌ 6—8 μ.

Hab.: cum mycelio *Meliolae byrsonimae* Stev. on *Byrsonima* sp., Cordillera Central, prov. Santo Domingo, Villa Altagracia, 12. II. 1930, leg. E. L. Ekman (*No. 3290*).

Mycelium whitish, very loose, scattered among the mycelium of the *Meliola*; conidiophores hyaline, straight, erect, simple, more or less aggregated (but never on true sporodochia), septate, short (but variable in lenght), 5—7 μ wide, with one apical conidium each; conidia hyaline, slightly falcate (also hooked at the ends) to straight, as a rule 3—4-septate (but also up to 4—8-septate), 87—94 by 5—7 μ, up to 93—107 by 6—8 μ.

May be distinguished from *Fusarium meliolicolum* Stev. (Bot. Gaz., Vol. LXV, pag. 245. 1918), found on *Meliola paulliniae* in Puerto Rico, for shape and size of conidia, and because it has not been found

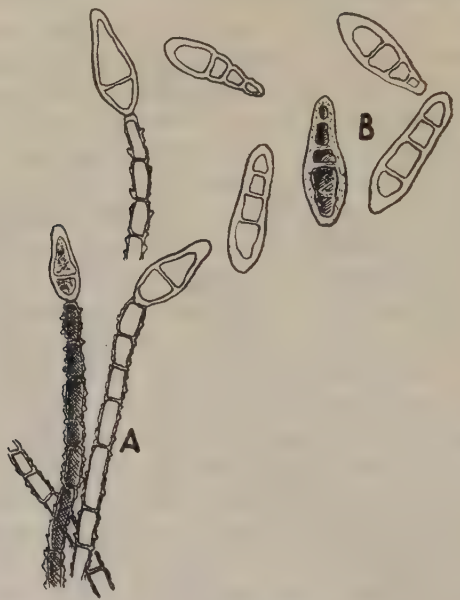

Fig. 9. *Divinia diatricha* Cif.: A. Conidiophores with an acrogenous conidium; B. Conidia.

together with a species of *Nectria* or allied genera. Of course, this is a „conventional" species, in expect of better knowledge from cultural characteristics.

8) **Divinia diatricha** Cif., n. sp. (Fig. 3).

Divinia Cif., n. gen. (dedicated the opticien Eustachio Divini, ideator of one of the first composed microscope [„microscopio a braccio", Rome 1648], firstly introducing the use of plano-convex lenses with polar contrast).

Biophilum; mycelio parce evoluto, externo, fusco, septato; conidiophoris bene evolutis, fasciculatis, septatis, fuscis, erectis, monosporis, densissime incrustato-asperatis; conidiis acrogenis, singulis, ovoideis, transverse pluriseptatis, fuscis, levibus vel punctulatis.

Typus: **Divinia diatricha** Cif., n. sp.

Maculis nullis; coloniis nigris, velutinis, effusis, individualiter indistinctis sed confluentibus, indelimitatis, semper hyphophyllis, totam paginam inferiorem foliorum occupantibus, intra pilis nidulantibus; mycelio sterili parcissime evoluto, externo, ex hyphis paucis, laxe ramosis, septatis, olivaceo-fuscis, 3,5—5 μ composito; caespitulis singulis isolatisve vel pluribus confluentibus, sed laxe aggregatis, valde variabilibus, 100—500 μ diam., pro more 200—400 μ, 350—600 μ altis, ob canescentia foliorum pro parte velatis, ex conidiophoris pluribus (50—100 et ultra) compositis, fasciculatis sed non congestis: conidiophoris simplicibus, non ramosis, erectis, rectis vel curvulatis, densissime septatis, ad septa non vel leniter constrictis, brunneis usque nigris, base applanata, apice truncato-obtusato, pallidiore, leniter inflato-geniculato, per totam superficiem incrustato-asperatis vel indistincte spinuloso-dentatis, scaberrimis, 145—375 μ longis, 6—8 μ crassis; conidiis singulis, isolatis, perfecte acrogenis, rarius ovatis ellipsoideisque, saepe ovato-spathulatis, ad basem rotundato-truncatis, prope apicem plus vel minus conoideis, breviter elongatis usque sub-cylindricis, sub-truncatis vel sub-rotundatis, primo hyalino-fuscidulis, 1-septatis, dein brunneis usque nigrescentibus, typice 3-septatis, (rarius 4-septatis, rarissime 2-septatis), ad septa non vel vix modice constrictis, septis inaequaliter et irregulariter distributis, pro more cellulis centralibus brevioribus, tunica crassa sed irregulariter incrassata, levia vel punctulata, 28—43 by 12—15 μ, pro more 34—38 by 12—15 μ.

Hab.: in mycelio vetustissimo *Meliolae* sp. in foliis *Tournefortiae hirsutissimae,* in Republica Dominicana, Cordillera Central, prov. Santo Domingo, Haina, 13. VI. 1926, ipse legi (*No. 993*).

This genus is a meliolicolous *Helminthosporium* (s. latiore) for the shape of conidiophore and conidia, but distinct from the 3-septate members of this genus on *Meliola* (see Hansford, I. M. I. Myc. Pap. 15, p. 214. 1946) for the well developed and constant asperation covering the conidiophores, in many cases similar to small teeth or small thorns. It is also characteristic for the very scanty mycelium, size of fascicles, and so on. Only a few traces of the mycelium of *Meliola* are present.

9) *Oospora pucciniophila* Syd.

On *Meliola bidentata* Cooke, on leaves of *Distictis lactiflora* (Vahl.) P. DC., Valle del Cibao, prov. Santiago, Hato del Yaque, Dominican Republic, 6. VI. 1930, coll. R. Ciferri (*No. 4340*).

The specimen has been classified as *O. pucciniophila* Syd. (Ann. Myc., Vol. XV, p. 263. 1917) on the base of the almost total morphological identity of the *Oospora* on *Meliola* with *Oospora* on a specimen

of *Puccinia,* collected also in the Dominican Republic the same province (on *Puccinia heterospora* Beck. et Curt. on leaves of *Sida spinosa* L., Valle del Cibao, prov. Santiago; Santiago, road to S. José de las Matas, 16. XI. 1931, coll. R. Ciferri (No. 4946). The Sydow's species has been described also on *P. heterospora* but on *Sida javensis,* East Indies.

Here the description of the *Oospora* on *Puccinia,* better developed of the same species on *Meliola*: very small colonies, delicate and white, more or less effuse up to arachnoid, 0,5—1,5 mm diam., scattered, more frequently confluent or very near, but individually distinct; sterile hyphae hyaline, irregularly but scarcely branched, without evident septa, 1—1,5 μ, wide up to 2 μ; conidiophores very little differing from the hyphae reptant, without septa, 1,5—2 μ in thickness, but variable in lenght, from 15 to 50 or more μ, straight to sinuate, uniform in thickness or slightly thinned at the free end, hyaline; conidia in apical chains, easy to dissolve in individual members, from 2—3 up to 30 in number, without septa, oblong, ellipsoid or cylindric, obtuse but a little thinned at both ends, 2—6 ⇌ 1,5—2,5 μ, hyaline.

This species is clearly distinct from *O. meliolae* Hansf. (Proc. Linn. Soc. London, Vol. CLV, p. 40. 1943) found on *Meliola* in Uganda, having shorter conidia.

It is possible that the same or very allied species is *Oospora hyalinula* Sacc. (Michelia, Vol. II, p. 453. 1882) found on Capnodiales and Hyphales in temperate regions of Europe and Americ, at least from the morphological point of view; but lacking of further informations on this subject, we retain *O. hyalinula* Sacc. as distinct from *O. pucciniophila* Syd., on *Puccinia* and on *Meliola.*

10) **Titaea (Eu-titaea) pes-avis** n. sp. and **T. papilio mimeoma** n. sp. (Fig. 4 and 5).

Titaea pes-avis Cif., n. sp.

Coloniis in grege fungorum aliorum, et singulis indistinctis, nigris, velutinis, ut in *Meliola*; mycelio delicatissimo, ex hyphis hyalinis probabiliter septatis sed indistincte reptantibus, parcissime irregulariterque ramificatis, guttulatis, irregulariter distributis, 1,5—2 μ crassis; conidiophoris ab hyphis myceliaribus non vel parum distinctis, lateralibus, irregulariter dispositis, hyalinis, indistincte vel non septatis, simplicibus vel parce (1—2) ramificatis, non incrassatis, rectiusculis usque sinuosis, horizontalibus usque sub-erectis, 5—45 μ longis, 1,5—2,2 μ crassis; cellula apicali seu sterigma solitaria, ovoidea, ellipsoidea, et breviter cylindracea, hyalina, continua, variabili, facillime secedente sed cum conidio conjuncta, 2—3,5 μ diam., vel 2,5—2, 2—3 μ, conidiis singulis, stellatis vel ramoso-divaricatis, acro-

genis, isolatis, hyalinis, imperspicuis, a cellula basali et 2—4 cellulis lateralibus constitutis, ramulis 14—25 μ longis, circ. 3 μ latis, sursum longiuscule acuminatis vel acutatis, valde variabilis, quandoque aequilateris, quandoque 1—3 longioribus, symmetricis vel asymmetricis, non incrassatis, non septatis.

Hab.: in pagina superiore v. inferiore foliorum *Coccolobae* sp., cum *Meliolae* sp., *Cicinnobella epimeliolae* Cif., *Dactylaria dominagregem* Cif., *Helminthosporio panici* Stev. et fungis aliis, in Republica Dominicana, Valle del Cibao, prov. Santiago, Santiago, Hato del Yaque, prope Yaque flumen, 28. III. 1932, leg. R. et E. Ciferri (*No. 4931*).

Fig. 10. *Titaea pes-avis* Cif.: conidia.

The generic position of this species — and possibly of other specie of the same genus — is to be revised, in relation also to the monotypic genus *Araneomyces* v. Hoehn. (with *A. acarosporum* v. Hoehn.), a genus placed in the Tuberculariaceous family, an opinion expressed by Rostrup also for *Titaea* (see *T. maxilliformis* Rostr.) In the Hansford's list of the species of *Titaea* (I. M. I. Myc. Pap., No. 15, p. 207. 1946) the characteristics of the genus are widened in relation to the Saccardo's typus (*T. callispora* Sacc.).

The species are to be revised also in relation to the genus *Trinacrium* Riess, and possibly also *Triposporium* Corda and *Tripospermum* Speg.

In our specimen, the study of the species is complicated not only by the small size of the caducous conidia, but also for the presence of many fungi in the same colonies of which four or five only were determined.

Of the species up to-now described (*T. callispora* Sacc., *T. maxilliformis* Rostr., *T. rotula* v. Hoehn., *T. ornithomorpha* Sacc. et Trott.,

T. bialowiczensis Siemaszco, *T. hemileiae* Hansf., *T. doidgeae* Hansf., *T. triradiata* Hansf., *T. ugandae* Hansf., *T. toddaliae* Hansf., and *T. verrucosa* Hansf.) our species appears to be allied to *T. triradiata.*

Titaea mimeoma Cif., n. sp.

Coloniis nigris, punctiformibus, valde imperspicuis, melioloideis, rotundatis, singulis vel late confluentibus, amphigenis, 1—2 mm diam.; mycelio parcissime evoluto, hyalino-fumoso, ex hyphis ramosis, delicatis, indistincte septatis, irregulariter distributis, 1,2—1,7 μ crassis composito; conidiophoris repentibus, variabilibus, ob hyphis saepe indistinctis, lateralibus vel irregulariter insertis, non vel parce ramosis, rectiusculis vel sinuosis aut undulatis, non vel indistincte remote septatis, sub-hyalinis vel dilute fumosis, apice monosporis, circ. 1,5 μ crassis, 30—75 μ longis, non incrassatis; conidiis rotundatis, ovoideis, ellipsoideis, aut sub-irregularibus, 4—7 cellularibus, frequenter 2 cellulis binatis oppositis compositis, sine vel cum isthmo 1—3 cellulari connexis vel 4—6 cellulis symmetricis, triangularibus vel sub-polygonoideis in circulo dispositis, formatis, flavo-brunneis usque brunneis, cellulis lateralibus triangularibus (apicibus saepe obtusatis), applanatis, cellulis centralibus plus vel minus irregulariter quadrangularibus, flavo-brunneis usque sub-hyalinis, saepe a cellulis irregularibus vel polygonoideis compositis, crassiusculis, leviter tunicatis, 1—5 aculeis longis, acuminatis aut acutatis, simplicibus, continuis, hyalinis, divergentibus, plus vel minus regulariter oppositis usque sub-radiate dispositis, pro more 3—4 (1—2 basali, 2 apicali), rectis habentibus; conidiis in toto 10—15 μ diam., vel 12—15 by 10—13 μ, cellulis lateralibus 4—6 μ diam., cellulis centralibus 2,5—3,5 μ diam., ciliis 10—25 μ longis, consuete 15—20 μ, 1,2—1,5 μ crassis.

Hab.: in in mycelio *Meliolae* (Irenopsidis) *coronatae* var. *triumfettae* Stev., in foliis *Triumfettae semitrilobae* Jacq., socia *Cicinnobella truncatula* Cif. et *Isthmospora glabra* Stev., in Republica Dominicana, Valle del Cibao, prov. Santiago, Santiago, Hato del Yaque, 16. VIII. 1931, leg. R. Ciferri (*No. 4925*).

This species is belonging to the genus *Titaea* in the wider sense adopted by Hansford (l. c.), as well as to the genus *Aorate* Syd. (Ann. Mycol., Vol. XXVII, p. 84. 1929), a monotypic genus described for *A. costaricana* Syd. on *Eugenia* in Costa Rica. In the genus *Aorate* the conidial complex is formed by a central cell and 5 peripherical, globose cells, of which the first possess from 3 to 4 cilia, being hyaline and without septum. The habitus of our species is similar to the habitus of *Aorate,* but color, disposition and shape of cellular elements, number of cilia and relative size of organs are different. Of other hand, our species is allied also to the genus *Titaea* (as typified by *T. callispora*), but having 2 pairs of lateral cells (instead of 3), 2 pairs of setae (instead of 3), and for minor characteristics.

Boedijn (Sydowia, Vol. V, p. 225. 1951) referred *Aorate costaricana* to the genus *Titaea*. This statement may be accepted but only in part.

In spite of the difference in the colour of conidia, in our opinion this group of fungi is clearly allied, and may be enclosed in the genus *Titaea* s. latiore but with two of subgeneric, taxa namely:

1) *Titaea* subg. **Eu-titaea** nov. [typus: *T. callispora* Sacc.].

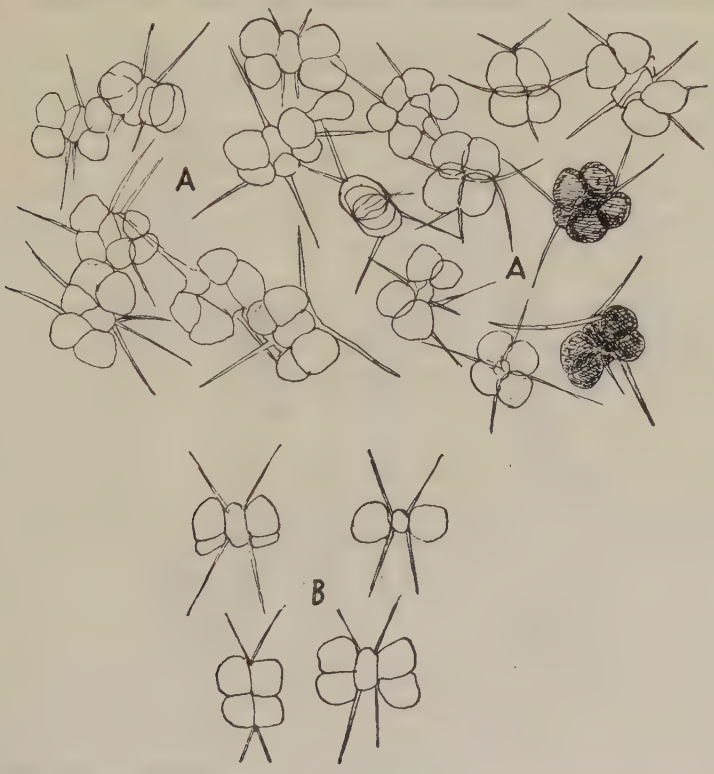

Fig. 11. *Titaea mimeoma* Cif.: Conidia, side and front view.

2) *Titaea* subg. **Aorata** (Syd.) comb. nova [typus: *T. costaricana* (Syd.) Boedijn 1951].

3) *Titaea* subg. **Papilio** nov. [typus: *T. mimeoma* Cif.].

Here the diagnosis of *Titaea* subg. *Papilio:*

Hyphis sterilibus fumosis non vel vix septatis, ramosis; conidiophora repentia brevia, plus vel minus indifferentiata; conidia brunnea, e cellulis simplicibus 4—7 quadrangularibus composita, quandoque 2 cellulis binatis lateralibus oppositis, 0—3 cellulis centralibus connexis composita, vel e 5—6 cellulis triangularibus, in circulo

dispositis formata, cum 1—5 ciliis longis, acuminatis, hyalinis, longiusculis, divergente-oppositis, continuis.

It is possible that a fourth subgenus may be founded on *T. toddaliae* Hansf. (l. c.). The shape of the conidial complex of *T. mimeoma* is very variable, having up to 5 or 6 almost triangular (never spherical) cells, disposed following the sectors of a circle, and then without (or a not evident) axial cell. The cilia are similar to those of *Aorate*, but apparently are generated by thickening of the cellular wall. In

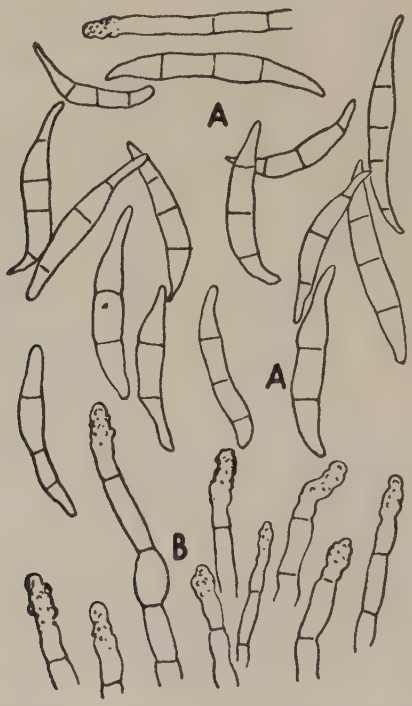

Fig. 12. *Dactylaria domina-gregem* Cif.: A. Conidia; B. Fertile tip of conidiophores.

the most typical shape, the conidial complex of *T. mimeoma* is like a butterfly, of which the two pairs of lateral cells are the wings, and the three small central cells are respectively the head, the torax and the abdomen.

The study of the specimen is complicated by the presence of *Isthmospora glabra* Stev. of an allied general aspect, but differing in many characteristics from *Titaea.*

11. **Dactylaria domina- gregem** n. sp. (Fig. 6).

Coloniis albo-griseis vel cinerascentibus, frequenter griseo-violaceis, effusis, pulverulentibus, mox evidentibus, pro-more sub-

nitidis, coloniis *Meliolae* obtegentibus, rotundatis, orbicularibus aut irregularibus, singulis vel confluentibus, pro more pluribus unitis, 2—6 mm diam., vel 2—8 ⇌ 3—6 mm; mycelio ex hyphis hyalinis, septatis (saepe indistincte), irregulariter denseque ramificatis, rarius rectis, saepe arcuatis usque sinuosis, repentibus, 3—3,5 μ crassis constituto; conidiophoris hyalinis, repentibus vel sub-repentibus, rarius sub-erectis, irregulariter insertis, non ramificatis, longis, rectis vel curvatis aut sinuosis, prope base non incrassatis, rarissime prope medium sub-inflatis, 115—220 μ longis, pro more 145—175 μ, 8—10 μ latis, prope medium 2—4-septatis, vel tota longitudine 5—8 septatis, non constrictis, totaliter scaberrimis, usque dense incrassato-denticulatis, prope apicem non vel paullo irregulariter inflatis, sparsis, singulis, non aggregatis; conidiis pluribus, pro more 2—5, rarius ultra, rarissime singulis, ex apice conidiophorum aggregatis, facillime secedentibus, saepe leniter falcatis usque arcuatis, non, rarius plus vel minus, rectis, ad apicem contortis, fusarioideis, rarius cylindrico-attenuatis vel sub-fusoideis usque irregularibus, hyalinis, base bene attenuato-truncata, apice, rotundato, sub-rotundato, obtuso usque truncato, semper abrupte attenuato, junioribus elliptico- vel ovoideo-attenuato usque fusoideis, continuis vel 1-septatis, dein 2—4 (typice 3-) septatis, typice non constrictis, cellulis conidiorum symmetricis vel cellulis centralibus minoribus, apicalibus basalibusque longioribus, 40—75 ⇌ 7—11 μ, pro more 50—70 μ longis.

Hab.; parasiticus in mycelio *Meliolae* sp., in follis *Coccolobae* sp., in consortio cum *Cicinnobella epimeliola* Cif., *Helminthosporio panici* Stev., *Titaea pes-avis* Cif., etc., in Republica Dominicana, Valle del Cibao, prov. Santiago, Santiago, Hato del Yaque, prope Yaque flumen, 28. III. 1932, leg. R. et E. Ciferri (No. 4931).

This species is the first described in association with *Meliolae* or other groups of tropical Ascomycetes, and well distinct from the other few species attributed to the same genus *Dactylaria*.

In the pluristratified colonies on the leaves of *Coccoloba*, the *Dactylaria* species is found in the uppermost layer of the associated fungi.

12. **Sepedonium epimeliola** n. sp., **S. oidioides** (Speg.) n. comb. and **S. meliola** (Stev.) n. comb.

Sepedonium epimeliola Cif., n. sp.

Coloniis superficialibus, saepe indistinctis, meliolicolis, rarius plus vel minus distinctis, sordide roseis vel roseo-luteolis, diffusis, rotundatis vel orbicularibus aut irregularibus, indelimitatis, isolatis usque confluentibus, pulverulentibus aut effuso-pulverulentibus, rarius usque arachnoideis, 2—3,5 mm diam. vel longis; mycelio ex hyphis repentibus, hyalinis usque dilute flavidis, rectiusculis usque sinuosis,

parce irregulariter ramosis, remote indistincte septatis, irregulariter effusis, 3—4,5 μ crassis composito; conidiophoris sparsis, late irregulariterque distributis, erectis vel sub-erectis, 1—3 septatis, rectis vel varie curvatis, non fasciculatis nec ramosis, hyalinis usque flavidulis, variabilibus, usque 130—170 μ longis, 5—6 μ crassis, apice monosporis; conidiis isolatis singulis, perfecte acrogenis, globosis, rarius sub-globosis, facillime secedentibus, saepe ob fragmentatum apicem conidiophorum sub-caudatis, hyalinis, roseo- vel viridulo-hyalinis, dein flavidulis usque dilutissime flavo-brunneis, 10—30 μ diam., pro more 10—20 μ, episporio sub-indistincto, sed amplissime irregulariterque verrucoso vel tuberculato, verrucis irregularibus, saepe conoideo-truncatis aut mamilliformibus, valde variabilibus, usque 2 μ latis ornatis.

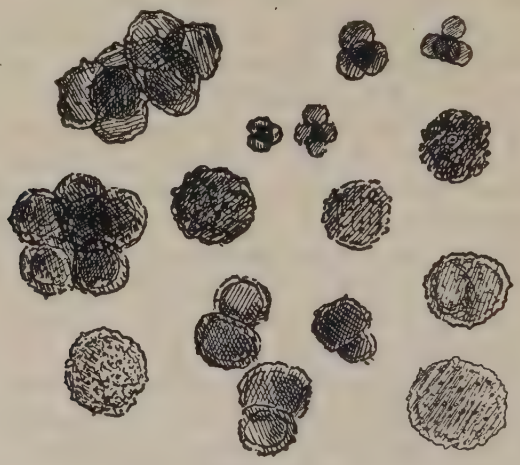

Fig. 13. *Sepedonium cpimeliola* Cif.: different size and agglomeration of conidia.

Hab.: in mycelio *Meliola ambigua* var. *casearíaecola* Cif. in foliis *Caseariae guianensis* (Aubl.) Urb., in Republica Dominicana, Llano Costero, prov. Santo Domingo City, banks of Río Ozama, 15. XII. 1931, leg. R. C., No. *2776* (typus); in *Meliola abrupta* H. et P. Syd. in foliis *Pictetiae spinifoliae* (Desv.) Urb., Ibidem, road from Santo Domingo City to La Caleta, 12. III. 1931, ipse legi, No. *3082*: in *Meliola angusta* Stev. et Teh., in foliis *Coccolobae laurifoliae* Jacq., Ibidem, La Caleta, 10. II. 1930, ipse legi cum E. L. Ekman, No. *3295*; in *Meliola anonaceari* Stev., in foliis *Oxandrae lanceolatae* (Sw.) Baill., Cordillera Septentrional, prov. Puerto Plata, Sosúa, 20. III. 1930, leg. E. L. Ekman, No. *3221*; in *Meliola burseraceari* Stev., in foliis *Tetragastridis balsamiferae* (Sw.) O. Kte., Cordillera Central, prov. Santo Domingo, Villa Altagracia, 12. II. 1930, ipse legi, No. *3090*; in *Meliola banarae* var. *aculeatae* Cif., Cordillera Septentrional, prov.

Puerto Plata Sosúa, at Jagua-Mocha, 3. IV. 1930, leg. E. L. Ekman, No. *3313.*

This fungus — or near allied species — is very frequent on colonies of Perisporiales, Microthyriales, etc., on Neotropical countries, but very rarely it is possible to study colonies sufficiently developed for the specific identification; in most cases only scattered conidia are evident. The conidia are, also, very variable in shape and in size, so that we are not sure that are pertaining to the same species; e. g. in the specimens No. *2736, 3082* and *3295* are very irregularly verrucose, 20—30 μ diam.; in the No. *3090* are greater (up to 60—80 μ) verrucose-incrustated, yellowish to brownish, somewhat with excentric drops simulating a septum; in the No. *3313* the conidia are only 10—20 μ in diam., with conidiophores of 130—170 by 6 μ, hyaline-yellowish, at last brownish, without evident double epispore; in the No. *3295* the conidia are also ovoid or ellipsoid, up to 27 by 20 μ, as a rule with the uppermost end brownish in color, and the lower yellowish to subhyaline. When isolated from the conidiophore, as a rule the conidia are aggregated together in tetrads or triads up to an irregular spore-balls (not rarely simulating the composed conidia of the genus *Stephanoma*), probably because the asperity of the epispore.

This species is near, but distinct, from *S. dubium* Sacc. (Bull. Orto Bot. Napoli, Vol. VI, p. 22. 1918) living on an undetermined mycelium on *Limala* sp. leaves in Malaya, but well distinct from **Sepedonium oidioides**(Speg.) Cif., n. comb. (= *Asterophora oidioides* Speg., Bol. Acad. Nac. Ci. Cordoba, Vol. XXIII, p. 165. 1919) upon *Meliola moelleriana* on leaves of *Abutilon striatum*, Paraguay, and from **S. meliola** (Stev.) Cif., n. comb. (= *Acremonium meliola* Stev., Bot. Gazette, Vol. LXV, p. 234. 1918) upon *Meliola paulliniae* on leaves of *Paullinia pinnata,* Puerto Rico, for shape and size of morphological elements. From the description, *Acremonium meliola* on the Hansford specimen (I. M. I. Myc. Pap., No. 15, p. 205. 1946) may be different from Stevens' species.

It would be necessary to revise also the genera *Sepedonium* Lk. and *Asteroma* Ditm. both fungicolous, in comparison with the species of *Acremonium* having rough conidia and long conidiophores (see above). In our cases, the adoption of the genus *Sepedonium* is justified also by the frequency of the species of the genus *Hypomyces* in the tropical rain forest.

Beiträge zur Systematik der Agaricales.

Von Rudolf Sandor, München.

I. Kresylviolett als gutes, differenzierendes Sporen-Färbemittel.

Während Kresylblau schon seit einiger Zeit besonders zur Färbung der Hyphenwandungen (meta- und orthochromatisch) verwendet wird, dürfte die Eignung des Kresylvioletts zur Sporenfärbung noch wenig bekannt sein. Keines der anderen, mir bekannten Färbemittel färbt — was die Sporen betrifft — so differenzierend. Schon in dünner, wässriger Lösung färbt es, bei sehr hellem Sichtfeld augenblicklich sehr gut. (Hierin übertrifft es bei weitem das Kresylblau, das ein bedeutend dunkleres Sichtfeld ergibt!). Natürlich kommt es im allgemeinen nur für hyaline oder hellgefärbte Sporen in Betracht. Zunächst färbt sich meistens nur der Sporeninhalt; dieser aber oft so differenziert, dass sogar membranäre Muster vorgetäuscht werden können. Bei einem Teil der Arten färben sich die Sporen sehr dunkel, bei einem anderen hell; einmal mehr rötlichviolett, das anderemal wieder mehr blauviolett, wobei eine richtige Metachromasie der Membranen, des Keimporus etc. nie aufzutreten scheint.

Ich möchte hier kurz zwei besonders bemerkenswerte Fälle anführen: So wird z. B. bei *Rhodopaxillus irinus* Fr. (= *Tricholoma irunum* sensu Singer 1943: Sporenstaub weiss und nicht rötelblass etc., Sporen glatt. Abbildungen: Lange 28 B und Michael-Schulz 1939, T. 25, descriptio pro parte!) sofort der Kern gefärbt, jedenfalls solange er noch direkt mit dem Hilum verbunden ist. Diese Kresylophilie des Kernes dürfte absolut konstant sein. Bei *Rhodopaxillus nudus* Fr. ex Bull. bleibt dagegen der Kern auch noch nach 20 Minuten ungefärbt, doch ragt manchmal gefärbte Substanz vom Hilum aus ein ganz klein wenig ins Sporeninnere vor; man kann also auch so die Verwandtschaft der beiden Arten nicht ohne weiteres bestreiten!

Die Sporen von *Lyophyllum agregatum* Fr. ex Schff.-Formen, nämlich der subsp. *cinerascens* (Bull.) Konrad forma conglobata sensu Singer (= *Clitocybe conglobata* sensu Killermann) und der var. *loricatum* (Fr.) Kühner zeigen sich ebenfalls sehr charakteristisch: Die Spore selbst wird nur sehr schwach gefärbt, umso stärker jedoch das Hilum (meist samt dem winzigen Hilärappendix), das sich als sehr dunkler Punkt deutlichst abhebt. Vielleicht ist diese Erscheinung

typisch für *Lyophyllum*, zumindest für die *Aggregata*. Zwar wird das Hilum noch bei mehreren anderen Arten stark gefärbt, doch ist die Wirkung da weit weniger augenfällig, da der Hilärappendix dort meistens grösser ist und in der Mehrzahl der Fälle selbst so gut wie ungefärbt bleibt.

Alle diese differenzierten Stellen bzw. Elemente kommen bei keinem anderen mir bekannten Färbemittel so zum Vorschein, sodass man wohl von einem kresylophilen Hilum bzw. Kern sprechen kann.

In Verbindung mit einer Anzahl von „Fixierungsmitteln" bzw. Beizen, besonders Schwefelverbindungen aller Art, vor allem aber mit Aluminiumsulfat ($Al_2(SO_4)3 + 18\,H_2O$) färbt Kresylviolett die epimembranären Sporenskulpturen von *Cortinarius, Hebeloma* und aller Wahrscheinlichkeit nach auch von *Crepidotus, Alnicola, Gymnopilus* und *Rozites*.

Ich habe mit folgender Methode die besten Ergebnisse erzielt: Es werden 2 Lösungen bereitet: 1. eine 5—15% wässrige Aluminiumsulfatlösung, 2. eine Mischung aus 6 ccm gesättigter, wässriger Kresylviolettlösung, 4 ccm Glyzerin und 1 ccm 96% Alkohol.

Eine möglichst dicke Lage Sporenstaub wird auf dem Objektträgerglas mit Lösung 1 getränkt; 2—3 Minuten einwirken lassen! Gut absaugen mit Fliesspapier oder dergl., so dass noch genügend Sporen übrigbleiben, um die Untersuchung nicht zu erschweren. Sodann die Farblösung auftropfen. Deckglas! Erst nach 10 Minuten hat die Färbung annähernd volle Stärke erreicht. Nicht bei allen Arten ist sie gleich intensiv. Optimal werden die Ornamente praktisch schwarz (mit braunviolettem Ton). Meist tritt eine Art Gerinnung der Farbe ein, was aber die Untersuchung nur unbedeutend stört. Man kann jetzt neben groben Warzen spinnfadendünne Verbindungslinien, verzweigte Linien und sogar feinnetzig verbundene Partien erkennen. Der Sporeninhalt bleibt hier nur ganz schwach gefärbt. Wenn glatte, untypische *Cortinarius*-Sporen vorliegen, färbt sich fast immer auch der Inhalt stärker. Hierin dürfte wohl der Hauptwert dieser Methode liegen! So konnte ich z. B. mit ihrer Hilfe feststellen, dass die Sporen von *Leucocortinarius bulbiger* (Fr. ex A.-S.) Lange tatsächlich überhaupt keine *Cortinarius*-Sporen sind! Es ist leicht möglich, dass man noch eine Verstärkung der Färbung erzielen kann, wenn man der Aluminiumsulfatlösung Tannin und Brechweinstein hinzufügt. Bei weissen, bzw. hellen, hyalinen, skulpturierten Sporen, z. B. von *Laccaria, Rhodopaxillus*, einschliesslich der amyloiden Sporen von *Melanoleuca, Russula* und *Lactarius* scheint die Methode durchwegs unwirksam zu sein.

Wichtig ist, dass sich nicht alle Kresylviolette hiefür eignen: Kresylechtviolett „Bayer" v. Stand. z. B. gerinnt mit Aluminium-

sulfat viel zu stark. Ich nehme für alles stets Kresylviolett „Merck", „Zur Nisslfärbung".

II. Die Alpha-Naphtol- und die Pyramidonreaktion bei *Psalliota.*

Diese beiden makrochemischen Reaktionen sind derart auffallend, dass ich mich wundere, in der Literatur noch keine Angaben darüber gefunden zu haben! Während Alpha-Naphtol (33% alkohol. Lösung!) bei der überwiegenden Mehrzahl aller Blätterpilze blaue (meist veilchenblaue) Reaktionen erzeugt, wirkt es bei *Psalliota* in diesem Lösungsverhältnis rot. Bei den *Flavescentes* (Schaeff. et Moell.) färbt es besonders die jungen, noch hellen Lamellen nach ca. 6—10 Minuten schön und auffallend rot (erdbeerrot bis karmin), ähnlich auch die gegilbten Stellen der Huthaut etc. Bei einem Vertreter der *Rufescentes* (Schaeff. et Moell.), nämlich bei *Psalliota bispora* Lange wirkt es nicht ausgesprochen rot, sondern nur fuchsrot bis gebranntsiena, an den Lamellen nur sehr schwach oder auch gar nicht. Bei einem Vertreter der *Sanguinolentae* (Schff. et Moell.) schwach rotbraun bis caputmortuum, bei einem anderen (wahrscheinlich *Ps. silvatica* Fr. ex Schff.) violettlich.

Die Pyramidonreaktion (gesättigte, wässrige Lösung) der inneren Stielknollen-Basis scheint sehr variabel zu sein, kann aber umso auffallender erscheinen, nämlich bei *silvatica* sofort feurig dunkelviolett, wie bei keinem einzigen anderen Pilz. Bei einer anderen, *silvatica*-ähnlichen Form, blieb sie dagegen völlig aus. Bei den *Flavescentes* wirkt Pyramidon ebenfalls sehr verschieden, meist mehr oder weniger schmutzig violettlila, oft sehr stark, aber bei weitem nicht die Intensität wie bei *Silvatica* erreichend. Bei *Bispora* endlich wirkte es überhaupt nicht violett, sondern nur bräunlich gelbrosa. An Farbenpracht könnten diese beiden Reaktionen mit der Schäfferschen Kreuzungsreaktion wetteifern!

Riesaminazione delle specie del genere Albugo in base alla morfologia dei conidi.

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Avvalendoci del materiale accumulato negli erbari del Laboratorio Crittogamico di Pavia e mercè l'ausilio degli erbari crittogamici di altri istituti e della raccolta privata effettuata nelle Antille dal Prof. R. Ciferri, abbiamo tentato una revisione delle specie del genere *Albugo* sulla base principalmente della forma e delle dimensioni dei conidi, essendo lo stadio conidico quello più facilmente reperibile su materiale in natura.

Con ciò si aveva lo scopo di tentare una discriminazione eventuale di entità sottospecifiche, seguendo la linea di lavoro tracciata da Savulescu e Rayss (1930) e da Rayss (1938), ma su maggior copia di materiale di diversa provenienza e di differente età, nonchè quello di controllare, entro certi limiti, la variabilità della forma e delle dimensioni dei conidi.

Con l'occasione si è cercato di elencare il maggior numero delle piante ospiti segnalate per ciascuna specie proseguendo il lavoro già iniziato dalla Dr. L. Pelluchi (1951) per *Albugo candida*.

Ringraziamo il Prof. F. Buchwald, direttore de „The Royal Veterinary and Agricultural College" di Copenhagen, che, come il compianto Dr. H. Sydow, ci è stato particolarmente prodigo di materiali del suo erbario, nonchè il Prof. F. L. Tai dell'Accademia Sinica di Pechino per averci fornito la lista delle specie delle piante ospiti sinora segnalate in Cina.

Rivolgiamo inoltre un particolare ringraziamento alla suddetta Dr. L. Pelluchi per aver iniziato la schedatura-base delle specie e delle piante ospiti riportate nel presente lavoro.

Precedenti revisioni monografiche

Il genere *Albugo* non è stato oggetto di monografie d'insieme ad eccezione delle specie nordamericane esaminate criticamente da Wilson (1907—1908) e delle specie sudafricane studiate dalla Wakefield (1927).

Le altre specie sono state descritte in contribuzioni micologiche sparse, per lo più non recenti, ed un notevole contributo alla loro conoscenza fu apportato da Zalewski (1883).

Savulescu e Rayss (1930) [e Rayss (1938)], sulla base di osservazioni biometriche limitate a pochi esemplari, se non uno per varietà, descrissero le seguenti forme:

Cystopus candidus (Pers.) Lév.: fo. *Alyssi alyssoidis* Sav. et Rayss; fo. *Brassicae nigrae*; fo. *Capsellae bursa-pastoris*; fo. *Coronopi procumbentis*; fo. *Hesperidis matronalis*; fo. *Lepidii perfoliati*; fo. *Sinapidis arvensis;* fo. *Syreniae sessiliflorae.*

Cystopus tragopogi (Pers.) Oudem.: fo. *tragopogi* Sav. et Rayss; fo. *Xeranthemi annui.*

Riteniamo opportuno fare cenno alla controversia, per altro non ancora risolta, aperta dalla Wakefield nel 1927, circa la validità del nome generico *Albugo* rispetto a *Cystopus.*

La prima descrizione del genere fu fatta sotto il nome di *Albugo* da Gray e risale al 1821, epoca in cui ancora era ignoto il ciclo riproduttivo completo del fungo e solo si conoscevano le forme conidiche.

Successivamente, ferme restando le nozioni morfo-biologiche, Léveillé (1847) descrisse il genere sotto il nome di *Cystopus,* nome che fu poi ripreso da De Bary (1863) il quale, avendo scoperto le oospore, diede una più completa descrizione morfologica del fungo.

Sotto questo nome il genere è stato usualmente accettato finchè gli studiosi sopratutto nordamericani, sulla base della legge di priorità, non riconvalidarono il nome generico *Albugo,* seguendo l'esempio del monografo Wilson. Da allora questo nome tendè ad essere adottato anche in Europa, senonchè nel 1927 Miss Wakefield, in conseguenza delle Regole Internazionali di Nomenclatura che stabiliscono, nel caso di funghi aventi un ciclo vitale polimorfo, soltanto la validità dei nomi proposti per lo stadio perfetto, riconvalidò il nome *Cystopus* attribuendo lo a De Bary invece che a Léveillé. Ma essendo questa norma stata stabilita per funghi diversi da Ficomiceti, non risultò chiaro se fosse da ritenersi valida anche per questo gruppo ed alcuni A. A., ad esempio Murphy (1918), ritennero che in questo caso non dovesse venire applicata.

In attesa di una risoluzione, che dovrà avvenire in sede di Commissione Internazionale, abbiamo creduto opportuno usare il nome generico *Albugo,* esendo oggi il più diffuso.

Tecnica di studio.

I prelievi sono stati fatti dalle pustole fogliari o caulicole e per il rigonfiamento dei conidi si è usato Lattofenolo Amann, avendo cura ogni volta di riscaldare leggermente il vetrino e lasciare riposare per dodici ore per ottenere il maggiore rigonfiamento.

Per quanto riguarda la morfologia si sono considerati come sferici o sferoidei i conidi in cui il diametro maggiore non supereva di un terzo il minore; questa forma è quella della loro grandissima maggioranza.

Non si sono prese in considerazione grandezza, localizzazione, disposizione, numero e colore dei sori, sia in quanto il materiale non fresco mal si prestava ad un esame comparativo, sia per il fatto che la variabilità di questi caratteri nella stessa pianta e persino nello stesso esemplare rendeva difficile una discriminazione.

Per ragioni analoghe non si è tenuto conto della forma e delle dimensioni dei conidiofori, i quali, pur nella loro variabilità, sono praticamente uniformi nelle specie esaminate.

La lettura delle dimensioni dei conidi è avvenuta secondo il massimo diametro previo accertamento della loro forma. Per ogni esemplare sono stati misurati 50—60 conidi (e in qualche caso 100—120) secondo il modulo di μ 2,5 e le letture, ordinate secondo la frequenza, sono state riportate in valore percentuale. Per brevità di esposizione i dati relativi a più esemplari di una sola specie di pianta ospite sono stati aggregati in una sola serie. Il diametro medio è dato dalla media ponderata, approssimata al micron, di tutte le letture effettuate per uno stesso ospite, mentre si è messa in evidenza anche la moda. Nelle diagnosi, le due cifre del diametro dei conidi includono i valori di almeno i tre quarti dei conidi letti.

Pure per amore di brevità non si è citata l'origine dei materiali studiati.

Allo scopo di avere un'idea circa la variabilità nel diametro dei conidi tra il materiale fresco e quello essiccato ed anche lungamente conservato in erbario, si è comparato il diametro dei conidi del l'*Albugo candida* in *Capsella bursa-pastoris* su materiale fresco con lo stesso di vecchie exsiccata. Si è osservato che, alla condizione di far rigonfiare i conidi del materiale essiccato a calore moderato e uniformente, non vi erano differenze nei diametri rispetto al materiale fresco.

Discussione dei risultati e conclusioni

I risultati conseguiti sulla base delle letture di 16.502 conidi distribuiti su 125 piante ospiti in 226 esemplari, permettono di asserire che forma e dimensioni dei conidi sono relativamente molto uniformi e mal si prestano a discriminazioni di specie ed entità infraspecifiche.

In tal modo si è riusciti soltanto a porre in evidenza due varietà in seno all'*Albugo candida*, due varietà in seno all'*Albugo ipomoeae-panduranae* e cinque varietà in seno all'*Albugo tragopogi*.

Di queste ultime due confermano altrettante varietà previamente descritte da Savulascu e Rayss, mentre non ci è stato possibile confermare le rimanenti varietà individuate da questi due studiosi almeno per le piante ospiti che abbiamo potuto studiare.

Come del resto era noto, caratteristiche morfologiche assai più importanti e significative sono offerte invece dallo studio delle

Pianta ospite	No esemplari	No conidi	Diam medio in μ	10 μ.	12,5 μ.	15 μ.	17,5 μ.	20 μ.	22,5 μ.	25 μ.	27,5 μ.	30 μ.
Amaranthaceae												
Amaranthus albus	1	100	15		15	62	23					
A. blitum	5	357	16	1	14	44	35	6				
A. patulus	1	100	16		9	41	44	5	1			
A. retroflexus	8	460	16		13	48	34	5				
A. viridis	1	103	15	1	16	63	19	1				
A. spp.	5	226	16		13	46	33	8				
Cyatula lappulacea	1	100	16		6	60	31	3				
Nyctaginaceae												
Boerhaavia erecta	1	104	15		14	62	21	2	1			
B. paniculata	1	100	14	1	26	66	7					
Portulacaceae												
Portulaca oleracea	6	340	15	1	19	52	26	1	1			
P. sativa	1	111	15		21	50	28	1				
P. sp.	1	105	16	1	22	53	22	2				
Caryophyllaceae												
Lepigonum marinum	2	100	17		1	37	52	10				
L. neglectum	2	104	19		1	9	34	38	15	2	1	
Spergularia media	2	100	19			11	30	39	13	6	1	
S. salina	4	168	18			19	54	24	2	1		
Capparidaceae												
Capparis rupestris	2	115	16		9	47	34	9	1			
C. spinosa	1	112	16		4	49	42	5				
Cruciferae												
Alliaria wasabi	1	105	16		10	46	37	7				
Alyssum calicinum	1	113	14	6	37	53	4					
Arabis albida	1	111	16		7	42	37	14				
A. alpina	2	100	15	1	25	64	10					
A. arenaria	1	106	15		25	64	11					
A. arenosa	3	163	15	3	31	49	16	1				
A. halleri	1	106	15		17	56	23	4				
A. hirsuta	1	100	13	9	57	32	2					
A. gerardi	1	102	14		42	54	4					
A. thaliana	2	100	13	12	66	21	1					
A. turrita	1	103	14		36	58	6					
Armoracia lapathifolia	3	158	15		14	56	26	1	1	1	1	
A. rusticana	5	258	16		5	56	29	9	1			
Barbarea lyrata	2	122	17		7	34	43	13	3			
B. vulgaris	3	157	14	1	14	47	32	5	1			
Berteroa incana	3	158	15	1	32	52	14	1				
Biscutella levigata	1	102	15		17	53	29	1				
Brassica campestris var. *rapa*	1	108	15	1	17	50	29	3				
B. integrifolia	1	104	15		41	44	15					
B. napus	1	51	16		10	45	43	2				
B. nigra	2	104	17		3	29	50	11	7			
B. oleracea	1	100	17		3	44	28	18	6	1		
B. oleraceae capitata alba	1	105	18		1	19	48	29	3			
B. oleracea capitata rubra	1	107	18		2	8	45	44	1			

Pianta ospite	No esemplari	No conidi	Diam medio in μ	10 μ.	12,5 μ.	15 μ.	17,5 μ.	20 μ.	22,5 μ.	25 μ.	27,5 μ.	30 μ.
B. rapa	1	109	16		12	42	37	9				
B. spp.	2	100	16		3	48	39	8	2			
Cakile maritima	2	109	18		1	23	48	24	4			
Calepina corvini	1	115	18		2	27	36	34	1			
Camelina microcarpa	1	100	17		1	24	60	13	2			
Camelina sativa	2	102	14	4	39	45	11	1				
Capsella bursa-pastoris	9	594	15	1	20	50	25	4				
Cardamine amara	1	103	15	2	26	49	22	1				
C. capensis	1	115	14	3	43	50	4					
C. hirsuta	1	108	13	6	64	27	3					
C. pratensis	1	128	14	5	51	42	2					
Cochlearia anglica	1	101	15		16	60	23	1				
C. armoracia	1	121	16		3	45	43	9				
C. danica	1	124	14	4	54	36	6					
C. officinalis	3	153	16		6	61	29	4				
Coronopus procumbens	1	115	15	1	12	57	28	2				
C. ruellii	1	107	16		15	49	32	4				
Draba incana	1	101	13	5	73	22						
Erysimum cheiranthoides	3	155	14	7	35	52	6					
E. repandum	2	155	14	1	47	44	8					
E. orientale	1	108	16		3	65	29	3				
Farsetia incana	1	100	13	6	54	38	2					
Heliophila meyeri	1	100	16		13	61	22	4				
Lepidium perfoliatum	1	101	14	2	35	59	4					
Nasturtium amphibium	1	108	16		5	43	44	8				
N. armoracia	2	101	16		10	56	27	7				
N. palustre	2	112	16		13	51	30	6				
N. terrestre	1	101	15	1	15	60	22	2				
Neslia paniculata	2	112	14	3	9	58	28	2				
Raphanistrum segetum	2	102	16		7	43	47	3				
Raphanus raphanistrum	1	106	16		10	43	36	9	2			
R. sativus	2	133	18		4	27	38	23	6	2		
Rapistrum rugosum	1	100	18	2	16	62	18	2				
Senebiera sp.	1	118	16		16	47	34	3				
Sinapis arvensis	1	119	17		4	32	47	16	1			
Sisymbrium loeselii	2	157	15	2	10	59	25	4				
S. officinale	6	332	15	1	28	41	28	2				
S. orientale	1	104	14	1	37	51	11					
S. pannonicum	1	100	15		15	66	17	2				
S. silvestre	1	103	15	2	23	62	11	1	1			
S. sophia	5	254	13	6	68	24	2					
Teesdalia nudicaulis	1	130	14	7	47	43	2	1				
Thlaspi alliacemum	1	103	13	12	58	28	2					
T. arvense	2	103	15	1	16	52	31					
Turritis glabra	3	158	14	3	37	54	6					
Resedaceae												
Reseda alba	1	100	14	3	38	50	9					
Convolvulaceae												
Convolvulus pseudotricolor	1	104	17		2	27	61	10				
Ipomoea batatas	3	174	16		4	52	39	5				
I. hederacea	2	157	15		19	66	14	1				
I. nil	1	105	17		4	33	59	4				

Pianta ospite	No esemplari	No conidi	Diam medio in μ	10 μ.	12,5 μ.	15 μ.	17,5 μ.	20 μ.	22,5 μ.	25 μ.	27,5 μ.	30 μ.
I. pandurata	1	102	16		10	55	32	3				
I. rubra	1	110	17		5	36	52	7				
I. tiliacea	1	110	17		2	24	48	24	2			
I. pes-caprae	1	100	16		5	53	40	2				
Compositae												
Ambrosia artemisiae-folia	1	110	18			10	44	45	1			
Artemisia vulgaris	2	100	17		5	36	46	12	1			
Chamomilla nobilis	1	100	18		2	17	50	27	4			
Carpesium cernuum	1	101	17		6	39	39	14	2			
Centaurea jacea	1	101	18		1	21	51	24	3			
C. scabiosa	4	236	18		2	18	50	21	7	2		
Cirsium arvense	4	260	20			2	22	45	25	5	1	
C. palustre	1	112	21			1	17	30	40	12		
C. rivulare	1	103	22				6	24	47	22	1	
C. oleraceum	6	383	21			2	15	36	32	11	3	1
Chrysanthemum parthenium	1	110	17		2	44	44	9	1			
C. sp.	1	100	18		1	25	44	23	7			
Filago arvensis	2	100	16		11	52	31	5	1			
F. germanica	1	102	15		27	58	15					
F. minima	1	101	16		18	46	24	11	1			
Inula britannica	2	113	18		1	16	40	39	3	1		
I. hirta	2	150	16		13	53	33	1				
Pyrethrum parthenium	1	100	16		5	43	50	2				
Scorzonera hispanica	3	156	20		1	6	26	38	23	5	1	
S. humilis	1	118	20			3	29	34	24	8	2	
S. sp.	1	100	18			10	51	33	6			
Tragopogon coloratus	1	102	18			14	48	31	7			
T. maior	3	152	18		1	20	56	20	2	1		
T. orientalis	1	101	17		2	25	59	12	2			
T. pratensis	2	101	18			17	64	19				
T. porrifolius	2	102	18			21	49	24	4	2		
T. sp.	1	109	18			20	39	27	12	2		
Xeranthemum annuum	1	100	15		18	64	17	1				
X. cylindricum	1	100	15		15	78	6	1				

Nota: Nella tabella i dati sono stati riportati secondo il nome della pianta ospite letto sulle exsiccata, e non sono stati aggregati, benchè ne sia stato tenuto conto, i dati relativi agli ospiti sinonimi.

oospore, sia in relazione alla eventuale scultura dell'episporio che ai loro diametri.

Ne deriva come conseguenza che lo studio della forma conidica di un'*Albugo* su un ospite previamente non noto offre poche probabilità di individuare nuove eventuali entità specifiche o infraspecifiche e devesi fare ogni sforzo per esaminare sopratutto le oospore eventualmente presenti anche ricercandole, se è il caso, a stagione più avanzata e in sedi anatomiche diverse da quelle ove si formano i sori conidigeni.

D'altro lato appare altresì evidente che lo studio biometrico, anche se molto spinto, di un solo o di pochi esemplari della stessa specie di *Albugo* sulla identica pianta ospite, può indurre in errore, sia in relazione al diverso diametro che di solito presentano i conidi apicali delle catenelle rispetto a quelli basali, sia in relazione ai diametri dei conidi dei sori di recente formazione e in via di sviluppo rispetto a quelli dei sori completamente maturi.

Clavis analytica specierum generis Albugi.

A. In *Piperaceis*
Oosporis verrucosis 30—60 µ diam.;
Conidiis 15—20 µ diam. (1) *A. tropica* Lagerh. apud Wilson

B. In *Chenopodiaceis*
a) oosporis verrucosis 39—55 µ diam.;
conidiis subglobosis 18—22 µ diam. (2) *A. eurotiae* Tranzsch.
aa) oosporis reticulatis 50—60 µ diam.;
conidiis breviter cylindraceis (11) *A. portulacae* (DC.) Kze.
(3) *A. occidentalis* Wilson

C. In *Amaranthaceis*
a) oosporis notis;
conidiis sphaericis vel sphaeroideis;
b) oosporis levibus;
conidiis cuboideis 16—18 µ diam. (4) **A. gomphrenae** (Speg.) Cif. et Biga
bb) oosporis reticulato-areolatis 50—60 µ diam.
conidiis sphaeroideis 10—20 µ diam. (5) *A. bliti* (Biv.) Kze.
aa) oosporis adhuc ignotis; conidiis ellipticis vel cylindraceis 12—34 ⇌ 9—20 µ diam.
(6) *A. achyranthis* (P. Henn.) Miyabe apud Ito et Tokunaya

D. In *Nyctaginaceis*
oosporis reticulatis 55—85 µ diam.;
conidiis globoso-cuboideis 18—22 µ diam. (7) *A. platensis* (Speg.) Swingle

E. In *Aizoaceis*
a) oosporis reticulatis; conidiis 8—19 µ diam.;
b) oosporis 41—53 µ diam.;
conidiis 12—19 µ diam. (8) *A. molluginis* Ito
bb) oosporis 60—80 µ diam;
conidiis 8—14 µ diam. (9) *A. trianthemae* Wils.
aa) oosporis papillosis;
conidiis 14—24 µ diam. (10) *A. austro-africana* H. et P. Sydow

F. In *Portulacaceis*
oosporis reticulatis 45—70 µ diam.;
conidiis 12,5—17,5 µ diam., typice 15 µ (11) *A. portulacae* (DC.) Kze.

G. In *Caryophyllaceis*
oosporis tuberculatis vel spinulosis usque papillatis;
conidiis 15—25 µ diam., typice 17,5—20 µ (12) *A. caryophyllacearum* Kze.

H. In *Capparidaceis*
a) oosporis verrucosis 30—40 µ diam.;
conidiis 12,5—20 µ diam., typice 15—17,5 µ diam.
(13) *A. capparidis* (De Bary) Cif.
aa) oosporis adhuc ignotis;
conidiis 13—21 µ diam. (14) *A. chardoni* Weston

I) In *Cruciferis*
oosporis verrucosis 35—55 μ diam.;
conidiis 10—22,5 μ diam. (15) *A. candida* (Pers.) Kze.
*) conidiis typice 12,5—15 μ diam. (15 a) *A. candida* (Pers) Kze. **candida**
**) conidiis typice 15—17,5 μ diam.
(15 b) *A. candida* (Pers.) Kze. **macrospora** Togashi

J. In *Resedaceis*
oosporis verrucosis 50—55 μ diam.;
conidiis 10—17,5 μ diam., typice 12,5—15 μ
(16) *A. resedae* (Rayss) Cif. et Biga

L) In *Crassulaceis*
oosporis adhuc ignotis;
conidiis 20—24 μ diam. (17) *A. tilleae* (Lagerh.) Cif. et Biga

M. In *Papilionaceis*
oosporis ignotis; conidiis 10—16 μ diam.
(17 bis) **A. mauginii** (Parisi) Cif. et Big.

N. In *Convolvulaceis*
a) oosporis levibus 39—48 μ diam. (18) *A. ipomoeae-aquaticae* Sawada
aa) oosporis sculptis;
b) oosporis episporio papillato, spinuloso v. tuberculato;
c) oosporis 29—44 μ, pro more 39 μ diam.;
conidiis 10—20 μ diam., typice 14 μ
(19) *A. minor* (Speg.) Cif.
cc) oosporis 38—51 μ, pro more 45 μ diam.;
conidiis 8—19 μ, pro more 13 μ diam.
(20) *A. ipomoeae pes-caprae)* Cif.
bb) oosporis episporio irregulari reticulato-tuberculato
25—55 μ diam., pro more 30—35 μ
(21) *A. ipomoeae-panduranae* (Sch.) Swingle.
*) conidiis 12—20 μ, typice 15—17 μ diam.
(21 a) *A. ipomoeae-panduranae* (Sch.) Swingle **ipomoeae-panduranae**
**) conidiis 12—20 μ, typice 20 μ diam.
(21 b) *A. ipomoeae-panduranae* (Sch.) Swingle **tiliaceae** Cif. et Biga
bbb) oosporis episporio irregulari;
e) episporio undulato-punctato 33—44 μ, pro more 37—41 μ diam.;
conidiis 11—15 μ diam. (22) **A. evolvuli** (Damle) Cif. et Biga
ee) episporio tuberculato-rugoso 26—39 μ diam.;
conidiis 16—24 μ, pro more 19—20 μ diam.
(23) *A. ipomoeae-hardwikii* Sawada

O. In *Boraginaceis* *)
oosporis areolatis 49—50 μ diam.;
conidiis 17,8—19,6 μ diam. (24) *A. cynoglossi* (Unamuno) Cif. et Biga

P. In *Scrophulariaceis*
oosporis adhuc ignotis;
conidiis 13—28 μ diam. (25) *A. evansi* Syd.

Q. In *Acanthaceis*
conidiis quadratis 18—25 μ diam. (26) *A. quadrata* (Kalch. et Cooke) Kze.

R. In *Gentianaceis*
a) oosporis reticulato-papillatis 45—50 μ diam.;
conidiis 11—16 μ diam. (27) *A. swertiae* (Berl. et Kom.) Wils.
aa) oosporis reticulato-sulcatis 50—60 μ diam.;
conidiis 18—26 μ diam. (27 bis) **A. centaurii** (Hansf.) Cif. et Biga

*) Species dubia sed forsitam includenda, propter oosporas papillatas est: *Albugo sibirica* (Zalewski) Wilson, Bull. Torrey Bot. Club **34**, 68. 1907.

S. In *Compositis*

a) oosporis episporio areolato-reticulato;

b) oosporis areolatis 45—72 μ diam.; conidiis 10—23 μ diam. (28) *A. chardiniae* Bremer et Petrak

bb) oosporis reticulatis 60—66 μ diam.; conidiis 20—22 μ diam. (29) *A. solivae* Schroet.

aa) oosporis, episporio variabili, reticulato spinuloso v. tuberculato usque papillato, 44—68 μ diam. (30) *A. tragopogi* (Pers.) Schroet.

°) conidiis parum variabilibus

*) conidiis pro more 17,5—20 μ diam. (30 a) *A. tragopogi* (Pers.) Schroet. **tragopogi**

) conidiis pro more 15—17,5 μ diam. (30 b) *A. tragopogi* (Pers.) Schroet. **pyrethri Cif. et Biga

***) conidiis pro more 15 μ diam. (30 c) *A. tragopogi* (Pers.) Schroet. **xeranthemi-annui** Sav. et Rayss

°°) conidiis valde variabilibus;

x) conidiis minoribus, pro more 15—20 μ diam. (30 d) *A. tragopogi* (Pers.) Schroet. **inulae** Cif. et Biga

xx) conidiis majoribus, pro more 17,5—22,5 μ diam. (30 e) *A. tragopogi* (Pers.) Schroet. **cirsii** Cif. et Biga

Synopsis specierum.

1. *Albugo tropica* Lagerh. apud Wilson, Bull. Torrey Bot. Club, **34**, 68. 1907.

Syn.: *Cystopus tropicus* Lagerh. in Pat. et Lagerh., Bull. Soc. Myc. France, **8**, 123. 1892.

In foliis Piperaceis cuiusdam forsitam *Peperomiae pellucidae* H. B. K. — America tropicali.

2. *Albugo eurotiae* Tranzsch. in Tranzsch. et Serebr., Myc. Ross., fasc. 3—4, no. 101. 1911.

Syn.: *Cystopus eurotiae* Sacc. et Trott. apud. Sacc., Syll. Fung., **24**, 34. 1926.

In foliis *Eurotiae ceratoidis* (L.) C. A. M. — Rossia.

3. *Albugo occidentalis* Wilson, Bull. Torrey Bot. Club, **34**, 80. 1907.

Syn.: *Cystopus occidentalis* Sacc. et Trott. apud Sacc., Syll. Fung., **21**, 859. 1912.

In foliis *Bliti capitati* L. (= *Chenopodii capitati* Asch.) (typus) nec non *Chenopodii rubri* L., *C. albi* L., ? *Betae vulgaris* L. (dubiae), *Spinaciae oleraceae* L. — America boreali et ? Europa.

4. **Albugo gomphrenae** (Speg.) Cif. et Biga, n. comb.

Syn.: *Cystopus gomphrenae* Speg., Ann. Mus. Nac. Buenos Aires, **19**, 283. 1909.

In foliis *Gomphrenae perennis* L. (typus) nec non *G. umbellatae* Remy, *G. sp.* — America australi.

5. *Albugo bliti* (Biv.) Kze., Rev. Gen. Pl., **2**, 659. 1891.

Syn.: *Uredo bliti* Biv., Stirp. Rar. Sicilia, **3**, 11. 1815. — *Caeoma amaranthi* Schwein., Transact. Amer. Philos. Soc., ser. 2, **4**, 292. 1832. *Erysibe quadrata* Wallr., Fl. Crypt. Germ., **2**, 194. 1833. — *Cystopus bliti* Lév., Ann. Sci. Nat., ser. 3, **8**, 371. 1847. — *Cystopus amaranthi* Berk., Grevillea, **3**, 58. 1847. — *Cystopus amaranthacearum* Zalew., Bot. Centrbl., **15**, 323. 1883. — *Cystopus cyathulae* Winter apud Roum., Rev. Myc., **11**, 66. 1889. — *Albugo froelichiae* Wils., Bull. Tor. Bot. Club, **35**, 362. 1908. — *Albugo cladothricis* Wils., Science, **2**, (27), 207. 1908. — *Cystopus froelichiae* Sacc. et Trott. apud Sacc., Syll., **21**, 859. 1912.

In foliis *Amaranthi bliti* L. (typus) nec non *Acnidae cannabinae* L., *A. atriplicis* ?, *A. tamariscinae* (Nutt.) Wood., *A. tamariscinae tuberculatae* (Moq.) Uline e Bray (= *A. tuberculatae* Moq.), *Alternantherae sessilis* R. Br. (= *A. triandrae* Lam.), *A.* sp., *Amaranthi adscendentis* Loisel. (= *A. viridis* L.), *A. albi* L., *A. angustifolii* Lam., *A. blitoidis* S. Wats., *A. caudati* L., *A. chlorostachydis* Will., *A. crispi* (Lesp. et Thev.) Braun, *A. dubii* Martius, *A. emarginati* Salzm., *A. gracilis* Desf., *A. graecizantis* L., *A. hybridi* L., *A. hybridi hypochondriaci* Bailey, *A. hybridi paniculati* Uline et Bray, *A. inamoeni* Willd., *A. mangostani* L., *A. palmeri* S. Wats., *A. paniculati* L., *A. patuli* Bert., *A. retroflexi* L., *A. silvestris* Desf., *A. spinosi* L., *A. tristis* L., *A.* sp., *Atriplicis retroflexi* L., *A.* sp., *Boseae* (= *Deeringiae) amherstianae* Hook., *Cladothricis lanuginosae* (Moq.) Nutt., *Cyathulae achyranthoideae* (H. B. K.) Moq., *C. globulifera* Moq., *C. lappulaceae* Moq., *C.* sp., *Digerae arvensis* Forsk., *Froelichiae gracilis* Moq., *F. campestris* Small., *F. floridianae* (Moq.) Nutt., *F.* sp., *Iresinis acicularis* Standley, *I. celosiae* L., *I.* sp. — Cosmopolita.

6. *Albugo achyranthis* (P. Henn.) Miyabe apud Ito et Tokunaya, Trans. Sapporo Nat. Hist. Soc., **14**, p. 1, no. 19, pag. 18. 1935.

Syn.: *Cystopus bliti* (Biv.) De Bary f. *achyranthis* P. Henn., in Engl. Bot. Jahrb., **28**, 259. 1901. — *Albugo bliti* Kze. f. *achyranthis* Sawada, Descript. Catal. Formosan Fgi., **2**, 25. 1922. — *Albugo achyranthis* apud Auct. Japon.

In foliis *Achyranthis asperae* L. (= *A. obtusifoliae* Lam.) (typus) nec non *A. japonicae* Nakai, *A. bidendatae* Blume. — Africa, Asia.

7. *Albugo platensis* (Speg.) Swingle, Journ. Myc. **7**, 113. 1892.

Syn.: *Cystopus platensis* Speg., Rev. Arg. Hist. Nat., **1**, 32. 1891.

In foliis *Boerhaaviae hirsutae* L. (typus) nec non *Allioniae incarnatae* L., *Boerhaaviae anisophyllae* A. Gray, *B. diffusae* L., *B. erectae* L., *B. paniculatae* Rich., *B. repentis* L. (= *B. coccineae* Mill.), *B. sonorae* Rose, *B. spicatae* Choisy, *B. viscosae* Lag. et Rodr., *B. xanti* Wats., *B.* sp., *Mirabilis jalapae* L., *Oxybaphi nyctaginei* (Mich.) Swet., *O. violacei* Choisy. — Africa, America, Asia.

8. *Albugo molluginis* Ito apud Ito et Tokunoyo, Trans. Sapporo Nat. Hist. Soc., **14**, p. 1, no. 19, pag. 18. 1935.

Syn.: *Albugo mangenoti* Mayor et Viennot-Bourgin, Bull. Soc. Myc. Fr. **67**, 115 (1951).

In plantis *Molluginis strictae* L. et *M. nudicaulis* Lam. — Japonia, Africa.

9. *Albugo trianthemae* Wils. Bull. Torr. Bot. Club, **35**, 361. 1908.

Syn.: *Cystopus trianthemae* Sacc. et Trott. apud Sacc., Syll., **21**, 858. 1912.

In foliis *Trianthemae portulacastri* L. (typus) nec non *Sesuvii portulacastri* L., *Trianthemae pentandrae* L. — America.

10. *Albugo austro-africana* H. et P. Sydow, Ann. Myc., **10**, 437. 1912.

Syn.: *Cystopus austro-africanus* Sacc. et Trott. apud Sacc., Syll. **24**, 33. 1926; Wakefield, Bothalia, **2**, 244. 1927.

In foliis *Aizoi rigidi* L. — Africa australi.

11. *Albugo portulacae* Kze., Rev. Gen. Pl., **2**, 658. 1891.

Syn.: *Uredo portulacae* DC., Fl. France, **5**, 88. 1815. — *Caeoma candidum* Nees var. *portulacearum* Schlecht., Flora Berol., **2**, 117. 1824. — *Erysibe quadrata* Wallr., Fl. Crypt. Germ., **2**, 194. 1833. — *Uredo candida* var. *portulacearum* Rabh., Deutch. Kryptfl., **1**, 13. 1844. — *Cystopus portulacae* Lév., Ann. Sci. Nat., ser. 3, **8**, 371. 1847.

In foliis *Portulacae oleraceae* L. (= *P. sativae* Haw.) — Cosmopolita.

12. **Albugo caryophyllacearum** (Wallr.) Cif. et Biga, n. comb.

Syn.: *Erysibe sphaerica* β *caryophyllacearum* Wallr., Fl. Crypt. Germ. **2**, 193. 1833. — *Erysibe sphaerica* Wallr. var. *arenariae-marinae* Wallr., Fl. Crypt. Germ. **2**, 193. 1833. — *Uredo candida* Pers. var. *caryophyllacearum* Rabh., Deutsch. Kryptfl., **1**, 13. 1844. — *Erysibe arenariae-marinae* Wallr. in Rabh., Deutsch. Kryptfl., **1**, 13. 1844. — *Cystopus lepigoni* De Bary, Ann. Sci. Nat., ser. 4, **20**, 132. 1863. — *Albugo lepigoni* Kze., Rev., Gen., Pl. **2**, 658. 1891. — *Cystopus argentinus* Speg., Bol. Acad. Ci. Cordoba, **12**, 28. 1887.

In plantis *Spergulariae mediae* Presl (= *Arenariae mediae* L.; *Lepigoni medii* Wahl.) (typus) nec non *Spergulae arvensis* L., *Spergulariae campestris* Asch. (= *Arenariae rubrae* Pers.; = *Lepigoni rubri* Wahl.; = *Spergulariae rubrae* Presl), *S. grandis* Cambèss., *S. marginatae* Kitt., *S. platensis* Fenzl., *S. rupestris* Lebel, *S. salinae* J. et C. Presl (= *Arenariae marinae* Pall.; = *Lepigoni marini* Wahl.; = *Spergulariae marinae* Griseb.; = *Tissae marinae* Britton), *S. salinae neglectae* Druce (= *Lepigoni neglecti* Kindb.), *S. salinae urbicae* Gürke (= *S. urbicae* Nym.), *S. villosae* Cambèss., *S.* sp., *Tissae leucanthae* (Robs.) Greene. — Europa, America australi.

13. *Albugo capparidis* (De Bary) Cif., Not. Mal. Piante, no. 3, pag. 34. 1929.

Syn.: *Uredo candida* var. *capparidearum* Rabh., Deutsch. Kryptfl., **1**, 13. 1844. — *Cystopus capparidis* De Bary, Ann. Sci. Nat., ser. 4, **15**, 130. 1863; Zalewski, Bot. Centrbl., **15**, 222. 1883; Pirotta, Nuovo Giorn. Bot. Ital., **16**, 362. 1884.

In plantis *Capparidis spinosae* L. (= *C. rupestris* Sibth. et Sm.) (typus) nec non *Cleomis titubantis* Speg., *C. graveolentis* Rafin., *Dactylaenae pauciflorae* Griseb. — America, Europa.

14. *Albugo chardoni* Weston apud Chard. et Toro, Journ. Dept. Agric. Porto Rico, **14**, 222. 1920.

In foliis *Cleomis anomalae* H. B. K. — Colombia.

15. *Albugo candida* (Gmel. ex Pers.) Kze., Rev. Gen. Pl., **2**, 658. 1891.

Syn.: *Aecidium candidum* Gmelin, Syst. Nat. Linn., **2**, 1473. 1791; ex Pers., Syn. Meth. Fung., **1**, 223; 1801. — *Uredo candida* Pers., Synopsis Meth. Fung., **1**, 223. 1801. — *Uredo candida* α *thlaspeos* Pers., Ibidem. — *Uredo candida* γ *alyssi* Pers., Ibidem. — *Uredo cheiranthi* Pers., Ibidem, pag. 224. — *Uredo cruciferarum* DC., Fl. France, **2**, 596. 1815. — *Caeoma candidum* α *cruciferarum* Schlecht., Flora Berol., **2**, 117. 1824. — *Erysibe sphaerica* α *cruciferarum* Wallr., Fl. Crypt. Germ., **2**, 193. 1833. — *Uredo thlapsi* Sowerby ex Wallr., Ibidem. — *Cystopus candidus* Lév., Ann. Sci. Nat., ser. 3, **8**, 371. 1847. — *Cystopus sphaericus* Bonord. in Rabh., Fgi. Eur., no. 186. 1860. — *Cystopus alismatis* Bonord., Bot. Zeitg., pag. 193. 1861. — *Albugo candida* f. *heliophilae* P. Henn., Hedw., **37**, 293—295, 1898. — *Albugo wasabiae* Hara, Path. Agr. Pl., pag. 721. 1930. — *Albugo thlaspeos* Sawada, Dept. Agr. Gov. Res. Inst. Formosa, Report, no. 61, pag. 10. 1933.

15 a. *Albugo candida* (Gmel. ex Pers.) Kze. **candida** var. nova.

Conidiis typice 12,5—15 μ diam.

In plantis *Capsellae bursa-pastoris* Medic. (= *Bursae bursa-pastoris* Britton; = *Thlaspis bursa-pastoris* L.) (typus) nec non *Alliariae officinalis* DC., *Alyssi argentei* Willd., *A. calicini* L. (= *A. alyssoidis* L.), *A. maritimi* Lam. (= *Lobulariae maritimae* Desv.), *A. montani* L., *A. saxatilis* L., *A. tortuosi* Waldst. et Kit., *A. violacei* Hort., *Arabidis albidae* Stev., *A. alpinae* L., *A. arenariae* Schrank, *A. arenosae* Scop., *A. bellidifoliae* Jacq., *A. canadensis* L., *A. ciliatae* R. Br., *A. furcatae* Wats., *A. gerardi* Bes., *A. glabrae* (L.) Bernh., *A. halleri* L., *A. hirsutae* L., *A. lyratae* L., *A. muralis* Bert., *A. pendulae* L., *A. petraeae* Lamk., *A. pumilae* Wulf., *A. thalianae* L. (= *Arabidopsidis thalianae* Heynh.; = *Stenophragmatis thaliani* Celak.), *A. turritae* L., *A. virginicae* (L.) Trel., *A.* sp., *Barbareae intermediae* Bor., *B. lyratae* Asch., *B. praecocis* R. Br., *B. strictae* Andrz., *B. vulgaris* R.

Br., *B. Berteroae incanae* DC., *Biscutellae laevigatae* L., *B. didymae* L., *Cakilis edentulae* (Bigel) Hook., *C. lanceolatae* (Willd.) Schulze, *C. maritimae* Scop., *Calepinae corvini* Desv. (= *C. irregularis* Thell.), *Camelinae foetidae* Fries, *C. linicolae* Schimp., *C. microcarpae* Andrz., *C. sativae* (L.) Crtz., *Cardaminis africanae* L., *C. amarae* L., *C. axillaris* Wedd., *C. bulbosae* Schreb., *C. capensis* L., *C. chelidoniae* L., *C. douglassii* (Torr.) Britt., *C. hirsutae* L., *C. loudovicianae* Hook., *C. parviflorae* L., *C. pennsylvanicae* Muhl., *C. pratensis* L., *C. silvaticae* Lk., *C. stylosae* DC., *C. trifoliae* L., *Cheiranthi asperi* Cham. et Schl., *C. cheiri* L., *C. pacifici* Sheldon, *C.* sp., *Cheiriniae* sp., *Chorisporae tenellae* DC., *Cochleariae anglicae* L., *C. armoraciae* L. (= *Nasturtii armoraciae* Fries; = *Radiculae armoraciae* Robin.; = *Roripae armoraciae* Hitch.), *C. danicae* Gunn., *C. groenlandicae* L., *C. officinalis* L., *Coringiae orientalis* Andrz., *Coronopi didymi* Sm. (= *Senebierae didymae* Pers.), *C. procumbentis* (L.) Gilib., *C. ruellii* All., *C.* sp., *Dentariae diphyllae* Michx. (= *Cardaminis diphyllae* Wood.), *D. enneaphyllae* L., *D. laciniatae* Muhl., *D. polyphyllae* Waldst. et Kit., *D. tenellae* Pursh., *D.* sp., *Descurainiae incisae* (Engelm.) Brit., *D. pinnatae* (Walt.) Brit., *D.* sp., *Diplotaxis erucoidis* DC., *D. muralis* DC., *D. tenuifoliae* DC., *Drabae aizoidis* L., *D. carolinianae* Walt., *D. cuspidatae* Bert., *D. elongatae* Host., *D. hispanicae* Boiss., *D. incanae* L., *D. lasiocarpae* Adams. (= *D. alpinae* Aitch.), *D. nemorosae* L., *D. thomasii* Koch., *D. wahlenbergii* Hartm., *Herophilae vernae* Mey. (= *E. vulgaris* DC.; = *Drabae vernae* L.), *Erucae sativae* Mill., *Erucariae myagroidis* (L.) Hal., *Erysimi asperi* DC., *E. cheiranthoidis* L., *E. erysimoidis* Fritsch, *E. hieracifolii* (L.) Jacq., *E. humilis* Pers., *E. macilenti* Bunge, *E. officinalis* L., *E. orientalis* R. Br., *E. repandi* L., *E. stricti* Gaertn. Mey. et Schreb., *E.* sp., *Euclidi syriaci* (L.) R. Br., *Eutremae wasabi* Maxim. (= *Alliariae wasabi* Prantl.), *Farsetiae incanae* R. Br. in Ait., *Fibigiae clypeatae* (L.) Medic. (= *Farsetiae clypeatae* R. Br. in Ait.), *Heliophilae meyeri* Sond., *H.* sp., *Hesperidis matronalis* L., *H. tristis* L., *Hirschfeldiae adpressae* Moench. (= *H. incanae* Lowe), *Hutchinsiae alpinae* R. Br., *H. pauciflorae* Nym., *H. petraeae* (L.) R. Br., *Iberidis amarae* L., *I. umbellatae* L., *I.* sp., *Iodanthi pinnatifidi* (Michx.) Steud., *Isatidis aleppicae* Scop., *Lepidii apetali* Willd., *L. campestris* (L.) R. Br., *L. densiflori* Schrad., *L. drabae* L., *L. graminifolii* L., *L. intermedii* Gray, *L. latifolii* L., *L. perfoliati* L., *L. pubescentis* Desv., *L. runcifolii* ?, *L. sativi* L., *L. virginici* L., *Lunariae annuae* L., *L. pachyrrizae* Borb., *Macropodii pterospermi* F. Sch., *Malcomiae africanae* R. Br. in Ait., *M. littoraneae* Ait., *Maresiae pulchellae* (DC.) Schulz., *Matthiolae incanae* R. Br. (= *Cheiranthi incani* L.), *Moricandiae arvensis* DC., *M. suffruticosae* Coss., *Myagri perfoliati* L., *Nasturtii officinalis* R. Br. (= *Roripae nasturtii* Hitch; = *R. nasturtii-aquatici* Schinz. et

Thell.; = *Sisymbrii nasturtii-aquatici* L.), *Nesliae apiculatae* F. M. et Avé-Lall. (= *N. paniculatae* Desv.), *Notoceratis bicornis* (Ait.) Caruel, *Ochtodii aegyptiaci* Desf., *Petrocallidis pyrenaicae* R. Br., *Rebaudiae pinnatae* (Viv.) Schulz., *Roripae austriacae* Spach (= *Nasturtii austriaci* Crantz), *R. bonaërensis* Macloskie (= *Nasturtii bonaërensis* DC.), *R. islandicae* (Oeder) Borb. [= *Nasturtii palustris* DC.; = *Radiculae palustris* (L.) Moench; = *Nasturtii terrestris* R. Br.], *R. islandicae hispidae* (Desv.) Butters et Abbe (= *Radiculae palustris hispidae* Robin.), *R. pyrenaicae* Spach (= *Nasturtii pyrenaici* R. Br.), *R. sessiliflorae* (Nutt.) Hitch. [= *Nasturtii sessiliflori* Nutt.; = *Radiculae sessiliflorae* (Nutt.) Greene], *R. silvestris* Bess. (= *Nasturtii silvestris* R. Br.), *R. sinuatae* (Nutt.) Hitch. (= *Radiculae sinuatae* Gray), *Senebierae* sp., *Sinapidis albae* L., *S. arvensis* L., *S. cheiranthi* Koch, *Sisymbrii altissimi* L., *S. arabidoidis* Hook., *S. canescentis* Nutt., *S. dentati* All. (= *S. pinnatifidi* DC.; = *S. bursifolii* Gouan; = *Arabidis pinnatifidae* Lam.; *A. dentatae* Clair.; = *Descurainiae pinnatifidae* Welb.; = *Stenophrogmatis pinnatifidi* Prantl.), *S. gariepini* Burch., *S. incisi* Engelm., *S. irio* (L.) Britt., *S. linifolii* Nutt., *S. loeselii* L., *S. millefolii* Ait., *S. officinalis* Scop., *S. orientalis* L., *S. pannonici* Jacq., *S. sinapistri* Crantz, *S. sophiae* L., *S. tanacetifolii* L., *S. thaliani* G. et Monn., *S.* sp., *Syreniae sessiliflorae* Ledeb., *Teesdaliae nudicaulis* R. Br., *T.* sp., *Thlaspis alliaceum* L., *T. alpestris* L., *T. alpini* Jacq., *T. arvensis* L., *T. calaminaris* Lej. (= *Lepidii calaminaris* ?), *T. cepaefolii* Koch, *T. glauci* A. Nels., *T. japonici* Boiss., *T. nuttalii* Rydb., *T. perfoliati*, *T. rotundifolii* Gaud., *T.* sp., *Torulariae torulosae* (Desf.) Schulz., *Turritis glabrae* L. — Cosmopolita.

15 b. *Albugo candida* (Gmel. ex Pers.) Kze. **macrospora** Togashi, Agric. and Horticult., **6**, 880. 1930.

Syn.: *Albugo brassicae* Sawada, Form. Fungi **5**, 16. 1933. — *Albugo macrospora* (Togashi) S. Ito ex Ito et Tokunaya, Trans. Sapporo Nat. Hist. Soc., **14**, parte 1, no. 15, pag. 17. 1935.

Conidiis typice 15—17,5 μ diam.

In foliis *Brassicae junceae* Coss. (typus) nec non *Armoraciae lapathifoliae* Gilib., *A. rusticanae* Gaertn., Mey. et Scherb., *Brassicae albae* Boiss., *B. alboglabratae* Bailey, *B. arvensis* (L.) Kuntze, *B. campestris* L., *B. campestris chinensis* Hort., *B. campestris toriae* Hort., *B. cernuae* Forbey Hemsl., *B. chinensis* L., *B. elongatae* Ehrb., *B. erucastrum* L. (= *Erucastri obtusanguli* Reichb.), *B. hirtae* Moench, *B. integrifoliae* (West.) Schulz., *B. japonicae* Siebold., *B. kaber* (DC.) Wheeler, *B. napobrassicae* Mill., *B. napi* L., *B. napi dichotomae* Hort., *B. nigrae* (L.) Koch, *B. oleraceae* L., *B. oleraceae acephalae* DC., *B. oleraceae botrytis* L., *B. oleraceae capitatae* Hort., *B. oleraceae capitatae albae* Hort., *B. oleraceae capitatae rubrae* Hort., *B. pekinensis*

Rupr., *B. rapae* L., *B. urbanianae* Schulze, *B.* sp., *Erucastri pollichii* Sch. et Sp., *Raphani raphanistri* L., *R. sativi* L. (= *R. caudati* L.), *Rapistri perennis* All., *R. rugosi* All. — Cosmopolita.

16. **Albugo resedae** (Jacz.) Cif. et Biga, n. comb.

Syn.: *Cystopus candidus* f. *resedae* Jaczewski, A key to fungi. Vol. 1, Phycom. pag. 293. 1931. — *Cystopus resedae* Rayss, Palest. Journ. Bot., ser. 1, **1**, 147. 1938.

In foliis *Resedae albae* L. — Palaestina, Rossia.

17. **Albugo tilleae** (Lagerh.) Cif. et Biga, n. comb.

Syn.: *Cystopus tilleae* Lagerh. in Pat. et Lagerh., Bull. Soc. Myc. France, **8**, fasc. 3, 167. 1891. antedated by Wilson 1907

In foliis *Tilleae rubescentis* H. B. K. — Aequatoria.

17 bis. **Albugo mauginii** (Parisi) Cif. et Biga n. comb.

Syn.: *Cystopus candidus* (Pers.) Lèv. var. *mauginii*, Parisi, Bull. Orto Bot. Napoli, **8**, 217—221. 1926.

In foliis *Onobrychidis cristae-galli* Lam.-Cyrenaica.

18. *Albugo ipomoeae-aquaticae* Sawada, Descript. Cat. Formosan Fgi., **2**, 27. 1922.

In plantis *Ipomoeae aquaticae* Forsk. — Formosa.

19. *Albugo minor* (Speg.) Cif., Nuovo Giorn. Bot. Ital., **35**, 129. 1928.

Syn.: *Cystopus convolvulacearum* var. *minor* Speg., Fgi. Guar. Pug. 1, pag. 65. 1883.

In plantis *Ipomoea batatas* Poir. — America.

20. Albugo ipomoeae pes-caprae Cif., Nuovo Giorn. Bot. Ital., **35**, 130, 1928.

In plantis *Ipomoeae pes-caprae* Roth. — America.

21. *Albugo ipomoeae-panduranae* (Schwein.) Swingle, Journ. Myc., **7**, 112. 1891.

Syn.: *Aecidium ipomoeae-panduranae* Schwein., Schr. Nat. Gesell. Leipzig, **1**, 69. 1822. — *Caeoma convolvulatum* Link in Willd., Sp. Pl., **6**, (2), 49. 1825. — *Uredo convolvulae* Spreng., Syst. Veg., ed. 16, **4**, 572. 1827. — *Aecidium ipomoeae* Schwein. in Berk., Grevillea, **3**, 60. 1874. — *Cystopus cubicus f. convolvuli* Berk., Ibidem pag. 58. — *Cystopus convolvulacearum* Otth. in Zalew., Bot. Centrbl., **15**, 223. 1883. — *Cystopus impomoeae-panduranae* Stev. et Swing., Trans. Kan. Acad. Sci., **11**, 67. 1889. — *Cystopus candidus f. convolvuli* Berl., Ic. Fung. Peronosp., pag. 7. 1898.

21 a. *Albugo ipomoeae-panduranae* (Schwein.) Swingle **Impomoeae-panduranae** var. nova.

Conidiis 12—20 μ diam., typice 15—17,5 μ.

In plantis *Ipomoeae panduratae* (L.) Mey. (typus) nec non *Colonyctionis aculeati* (L.) House (= *Ipomoeae bonanoctis* L.), *Convolvuli incani* Vahl., *C. japonici* Thumb., *C. tricoloris* L. (= *C. pseu-*

dotricoloris Viv.), *C. retusi* Colla, *C. sepii* L. (= *Calystegiae sepii* R. Br.), *C. siculi* L., *C. ulosepali* Hall., *Ipomoeae aegyptiae* L. (= *I. pentaphyllae* Jacq.), *I. bilobae* Forsk., *I. caloneurae* Meiss., *I. cardiosepalae* Hochst., *I. carolinae* Pursh. (= *I. commutate* Roem.), *I. catharticae* Poir., *I. chryseidis* Ker., *I. coccineae* L. (= *Quamoclitis coccineae* Moench), *I. eriocarpae* R. Br., *I. ficifoliae* Lindl., *I. gossypioidis* Parodi, *I. hederaceae* (L.) Jacq. [= *Convolvuli hederacei* L.; = *C. nil* L.; = *Ipomoeae nil* Roth; = *Merremiae hederaceae* (L.) ?; = *Pharbitidis hederaceae* Choisy], *I. incarnatae* Vahl., *I. jalapae* Michx., *I. lacunosae* L., *I. leptophyllae* Torr., *I. meyeri* (Spreng.) G. Don., *I. mexicanae* Gray, *I. obscurae* Ker., *I. purpureae* Roth. [= *Quamoclitis purpureae* (L.) Voigt], *I. quamoclit* L. (= *Convolvuli quamoclit* Spreng.; = *C. pennati* Lam.; = *Quamoclitis pennati* Bojer; = *Q. quamoclit* Britt.; = *Q. vulgaris* Choisy), *I. reniformis* Choisy, *I. simulantis* Hambury, *I. trichocarpae* Ell., *I. trilobae* L., *I.* sp., *Jacquemontiae nodiflorae* (Desv.) G. Don., *J. pentandrae* G. Don., *Operculinae aegyptiacae* (L.) House, *Thyellae tamnifoliae* Rafin. [= *Jacquemontiae tamnifoliae* (L.) Griseb.] — Cosmopolita.

21 b. *Albugo ipomoeae-panduranae* (Schwein.) Swingle **tiliaceae** Cif. et Biga, var. nova.

Conidiis 12—20 μ diam. typice 20 μ.

In foliis *Ipomoeae tiliaceae* Choisy. — America.

22. **Albugo evolvuli** (Damle) Cif. et Biga, n. comb.

Syn.: *Cystopus evolvuli* Damle, Journ. Indian Bot. Soc. **22**, 135. 1943.

In plantis *Evolvuli alsinoidis* L. — India.

23. *Albugo ipomoeae-hardwikii* Sawada, Dept. Agric. Res. Inst. Formosa, Report. no. 27. 1927; Cat. Formosan Fgi., **3**, 7. 1927.

In plantis *Ipomoeae hardwikii* Hemsl.— Formosa.

24. **Albugo cynoglossi** (Unamuno) Cif. et Biga, n. comb.

Syn.: *Cystopus cynoglossi* Unamuno, Bol. Real. Soc. Espan. Hist. Nat., **30**, 382. 1930.

In foliis *Cynoglossi cheirifolii* L. — Hispania.

25. *Albugo evansi* Sydow, Ann. Myc., **10**, 437. 1912.

Syn.: *Cystopus evansi* Sacc. et Trott. in Sacc., Syll. Fung., **24**, 34. 1926.

In plantis *Nemesiae sp.* (typus) nec non *Nemesiae strumosae* Benth. var. *suttonii* Hort. — Africa australi.

26. *Albugo quadrata* (Kalch. et Cooke) Kze., Rev. Gen. Pl., **2**, 658. 1891. — non *Erysibe quadrata* Wallr., Fl. Crypt. Germ. **2**, 194. 1833.

Syn.: *Cystopus quadratus* Kalch. et Cooke, Grevillea, **9**, 22. 1880.

In foliis *Hypoestis verticillaris* R. Br. — Africa australi.

27. *Albugo swertiae* (Berl. et Kom.) Wils., Bull. Torrey Bot. Club, **34**, 72. 1907.

Syn.: *Cystopus convolvulacearum* Speg. var. *swertiae* Berl. et Kom. Riv. Pat. Veg., **9**, 26. 1900. — *Cystopus swertiae* Sacc. et Trott. apud Sacc., Syll., **21**, 858. 1912.

In foliis *Swertiae connatae* („cognatae") Schrenk. — Mandshuria.

27 bis. **Albugo centaurii** (Hansf.) Cif. et Biga n. comb.

Syn.: *Cystopus centaurii* Hansf., Prc. Linn. Soc. New South Wales, **79**, parte 3—4, 97. 1954.

In foliis *Centaurii spicati* Fritsh-Australia.

28. *Albugo chardiniae* Bremer et Petrak, Sydowia, **1**, 248. 1947.

In plantis *Chardiniae orientalis* (Mull.) Kuntze. — Anatolia.

29. *Albugo solivae* Schroet., Hedw., pag. 210. 1896.

Syn.: *Cystopus solivae* Sacc. et Trott. apud Sacc., Syll., **14**, 458. 1899. — *Cystopus solivarum* Speg., Rev. Arg. Bot., **1**, 88. 1925.

In foliis *Solivae anthemidifoliae* R. Br., (typus) nec non *S. nasturtiifoliae* DC., *S. sessilis* Ruiz et Pav. — America australi.

30. *Albugo tragopogi* (Pers.) Schroet., Kryptfl., **3** (1), 294. 1886.

Syn.: *Uredo candida* β *tragopogi* Pers., Syn. Meth. Fung. pag. 223. 1801. — *Uredo obtusata* Link, Mg. Naturf. Freunde Berlin Observ., **1**, 4. 1809. — *Uredo cubica* Strauss, Wetteranisch. Ges. f. Naturk., **2**, 86. 1810. — *Uredo tragopogi* DC., Fl. France, **2**, 238. 1815. — *Uredo candida* β *tragopogonum* DC. apud DC. et Lamark, Fl. France, **6**, 88, 1815. — *Caeoma tragopogonis* Nees, Syst., pag. 15. 1817. — *Caeoma candidum* Nees, Ibidem. — *Uredo tragopogonis* Opiz, Crypt., pag. 150. 1818—1819. — *Albugo tragopogonis* S. F. Gray, Nat. Arr. Brit. Pl., **1**, 540. 1821. — *Uredo candida b cnici* Schub. apud Ficin., Fl. der Geg. um Dresden, **2**, 237. 1821—1823. — *Caeoma candidum b compositarum* Schlecht., Fl. Berol., **2**, 117. 1824. — *Caeoma centaureae* Ehremberg fide Link, Sp. Pl., **6**, p. 2, pag. 57. 1825. — *Uredo albugo*, Unger, Exanth., pag. 192. 1833. — *Cystopus cubicus* Lév., Ann. Sci. Nat., ser. 3, **8**, 371. 1847. — *Cystopus spinulosus* De Bary, Ann. Sci. Nat., ser. 4, **20**, 133. 1862. — *Cystopus tragopogonis* Schroet., Kryptfl., **3**, p. 1, 234. 1866. — *Cystopus brasiliensis* Speg., Bol. Ac. Nac. Ci., **2**, 481. 1889. — *Albugo spinulosa* Kze., Rev. Gen. Pl., **2**, 658. 1891. — *Albugo brasiliensis* P. Henn., Hedw., **35**, 210. 1896. — *Cystopus tragopogonis spinulosus* Davis, Trans. Wis. Acad., **2**, 165. 1897. — *Cystopus mikaniae* Speg., Myc. Arg., ser. 2, pag. 67. 1902.

30 a. *Albugo tragopogi* (Pers.) Schroet. **tragopogi** var. nova.

Conidiis parum variabilibus, pro more 17,5—20 μ diam.

In foliis *Tragopogonis porrifolii* L. (typus) nes non *Alomiae microcarpae* (Benth.) Rob., *Agerati conyzoidis* L., *Ambrosiae artemi-*

siaefoliae L., *A. psilostachyae* DC., *A. trifidae* L., *Anthemidis nobilis* L. (= *Matricariae nobilis* Baill.), *Antennariae plantaginifoliae* (L.) Rich., *A.* sp. *Artemisiae biennis* Willd., *A. canadensis* Michx., *A. vulgaris* L., *Cacniae turbinatae* Pers., *Chamomilla nobilis* Gr. et Gd., *Centaureae austriacae* Willd., *C. coriaceae* Waldst. et Kit., *C. jaceae* L., *C. nigrae* L., *C. rupestris* L., *C. scabiosae* L., C. sp., *Centipedae minimae* O. Kuntze, *Chondrillae junceae* L., *Cinerariae* sp., *Crepis glaucae* Torr. et Gray, *C. rhoedifoliae* Bieb. (= *C. foetidae* L.), *Dimorphothecae* sp., *Ecliptae albae* Haussk., *Eupatorii conyzoidis* Wahl., *E.* sp., *Franseriae* sp., *Gaertneriae acanthocarpae* (Hook.) Britton, *G. discoloris* (Nutt.) O. Kze., *Galinsogae caracasanae* (Schulz.) DC., *Gerberae jamesoni* Bolus, *G. plantagineae* Harv., *Gnaphalii uliginosi* L., *Helianthi annui* L., *H.* sp., *Helichrysi arenarii* Moench., *Ivae ambrosiaefoliae* Gray, *I. ciliatae* Willd., *I. xanthifoliae* Nutt., *I.* sp., *Jaegeriae hirtae* Less., *Matricariae matricarioidis* (Less.) Porter, *M.* sp., *Mikaniae phyllopodae* Griseb., *M. cordifoliae* Willd., *Prenanthidis tatarinerii* Max., *Podospermi calcitrapifolii* DC. (= *P. decumbentis* ?), *P. jacquiniani* Koch, *P. laciniati* DC. (= *Scorzonerae laciniatae* L.), *P. octangularis* Roth, *Pterothecae bifidae* Fisch. (= *Trichocrepis bifidae* Vis.; = *Lagoseris bifidae* Koch), *Saussureae* sp., *Scorzonerae austriacae* Willd., *S. hispanicae* L. (= *Tragopogonis undulati* Jacq.), *S. hirsutae* L., *S. humilis* L., *S. octangularis* Hort., *S. pusillae* Pall., *S. strictae* Horn., *S.* sp., *Senecii angustifolii* Willd., *S. aurei* L., *S. campestris* DC., *S. cymbaloidis* Nutt., *S. hartiani* Heller., *S. inaequidentis* DC., *S. integerrimi* Nutt., *S. lugentis* Rich., *S. oblanceolati* Rydb., *S. orbicularis* Sond., *S. pellucidi* DC. var. *ruderalis* Harv., *S. peninsularis* Vasey et Rose, *S. pinnulati* Thumb., *S. serrae integriusculi* Gray, *S.* sp., *Serratulae pallidae* DC., *S. pseudoarnicae* Less., *S. tintoriae* L., *Sonchi arvensis* L., *S. oleracei* L., *Tragopogonis colorati* C. A. Mey., *T. crocifolii* L., *T. dubii* Scop., *T. floccosi* Waldst. et Kit., *T. majoris* Jacq., *T. minoris* Fr., *T. orientalis* L., *T. pratensis* L., *T. pterodis* ?, *Xanthi saccharati* Wallr., *X. americani* Walt., *X. canadensis* Mill., *X. communis* Britt., *X. orientalis* L., *X. pennsylvanici* Wallr. — Cosmopolita.

Nota. La specie del genere *Albugo* citata in Index Pl. Dis., **1**, 194. 1950 su *Lactuca sativa* L. deve essere ancora studiata.

30 b. *Albugo tragopogi* (Pers.) Schroet. **pyrethri** Cif. et Biga, var. nova.

Conidiis parum variabilibus, pro more 15—17 μ diam.

In foliis *Pyrethri parthenii* Sm. (= *Chrysanthemi parthenii* Bernh.) (typus) nec non *Chrysanthemi laciniati* Huter, *C. leucanthemi* L. (= *Pyrethri leucanthemi* Franch.), *C.* sp., *Carpesii abrotanoidis* L. (var.), *C. cernui* L. — Europa.

30 c. *Albugo tragopogi* (Pers.) Schroet. **xeranthemi-annui** Sav. et Rayss

Sav. et Rayss.

Conidiis parum variabilibus, pro more 15 μ diam.

In foliis *Filaginis arvensis* L. (typus) nec non *F. apiculatae* Sm. (= *F. germanicae* L.), *F. gallicae* L., *F. minimae* Fr., *Xeranthemi annui* L., *X. cylindrici* Smith. — Europa, Palästina.

30 d. *Albugo tragopogi* (Pers.) Schroet. *inulae* Cif. et **Inulae** Cif. et Biga, var. nova.

Biga, var. nova.

Conidiis valde variabilibus minoribus, pro more 15—20 μ diam.

In foliis *Inulae hirtae* L. (typus) nec non *I. britannicae* L., *I. conyzeae* Lam., *I. ensifoliae* L., *I. grandiflorae* Willd., *I. japonicae* Thumb., *I. magnificae* Hort., *I. salicinae* L., *I. squarrosae* L. — Europa.

30 e. *Albugo tragopogi* (Pers.) Schroet. **cirsii** Cif. et Biga n. comb.

Conidiis valde variabilibus, majoribus pro more 17,5—22,5 μ diam.

In foliis *Cirsii oleracei* All. (typus) nec non *Cardui crispi* L., *Cirsii altissimi* (L.) Spreng., *C. arvensis* Scop. (= *Cnici arvensis* L.; = *Cardui arvensis* Robs.), *C. canadensis* ?, *C. cani* All., *C. dipsacolepis* Mats., *C. erisithalis* Scop., *C. japonici* DC., *C. lanceolati* Hill. (= *Cardui lanceolati* L.), *C. mutici* Michx. (= *Cardui mutici* Pers), *C. palustris* Scop., *C. rivularis* All., *C. segeti* Bg., *C. tuberosi* All. (= *bulbosi* DC.), *C. undulati* Spreng. (= *Cnici undulati* Gray), *C. spinosissimi* Scop. (= *Cardui spinosissimi* Walt.). — Europa.

Nota. E' stato inoltre descritto un *Cystopus molluginicola* Ramakrishnan et Ramakrishnan (Proc. Indian Acad. Sci. B., **32**, 97—98. 1950.) (= *Cystopus mysorensis* Safeeulla, Proc. Indian Sci. Congress, 1951, nomen nudum, fide Safeeulla et Thirumalachar, Phytomorphology, **1**, 212—215. 1951.) su *Mollugo cerviana* nell'India meridionale. Non e chiaro se questa specie sia distincta dall' *Albugo molluginis* Ito.

Species excludendae.

1. *Albugo parietariae* Roum. Fgi. Gall. 1352.

In plantis *Parietariae diffusae* M. et K. (*Urticaceae*). — Cosmopolita.

2. *Cystopus salsolae* Syd., Hedw., **38**, 142. 1899.

In plantis *Salsolae incanescentis* C. A. Mey. (*Chenopodiaceae*). — Persia australi. — Fide Wilson, Bull. Torrey Bot. Club, **34**, 83—84. Febr. 1907.

3. *Cystopus euphorbiae* Cooke et Mass., Grev., **20**, 106. 1892.

In plantis *Euphorbiae hebecarpae* Boiss. (*Euphorbiaceae*). — Persia. — Fide Wilson, Ibidem.

4. *Cystopus schlechteri* Syd., Hedw., **38**, 142. 1899.

In foliis *Claoxyli salsolae* ?. (*Euphorbiaceae*). — Africa australi. — Fide Wilson, Ibidem.

5. *Cystopus pulverulentus* Berk. et Curt., Journ. Linn. Soc., **10**, 357. 1869.

In foliis Compositarum. — Cuba.

6. *Albugo mors-uvae* (Schwein.) Kze., Rev. Gen. Pl., **2**, 442. 1891; Salmon, Monogr., pag. 70. 1900. Fide Oudemans, **3**, 367 *).

In plantis *Ribes uvae-crispae* L. (incl. *Ribes grossulariae* L.) (*Saxifragaceae*).

Summary.

The variability of the shape and size of conidia, belonging to the species of the genus *Albugo*, has been studied.

The great uniformity of these elements makes a differentiation of the species and a discrimination of eventual infraspecific taxa rather difficult.

Two intraspecific taxa of *Albugo candida*, two of *Albugo ipomoeae-panduranae* and five of *Albugo tragopogi* could however be identified.

Dried material as well as fresh material is suitable for biometrical study provided the same technique is always used for swelling conidia in Amann lactophenol.

As conclusion, an analytical, dichotomic key of the species of the genus *Albugo* known to the present time, is drawn up together with a list of the host-plants.

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*) Est Mucedinacea.

Zur Abbauintensität holzzerstörender Pilze.

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Meinem hochgeschätzten Lehrer, Herrn Prof. Dr. Otto Porsch, mit den herzlichsten Glückwünschen zum 80. Geburtstag.

Der Verfasser.

Einleitung.

Bei der Betreuung und Pflege von Pilzkulturen werden ständig neue Erfahrungen gesammelt, welche in den einzelnen Laboratorien festgehalten werden. So haben bereits Davidson, Campbell und Vaughn (1942) ein Karteiblatt entworfen, auf welchem die wichtigsten Merkmale der holzzerstörenden Pilze einzuschreiben sind. Auf diese Weise kann der Pilz und seine Kultur durch entsprechende Eintragungen übersichtlich charakterisiert werden. Auch die Verwendung von Lochkartenblättern ist äusserst günstig, wie dies im Forest Products Research Laboratory in Princes Risborough in England gehandhabt wird.

Einen wesentlichen Beitrag zur Bestimmung holzzerstörender Pilze nach den Merkmalen, welche man bei der Kultivierung beobachten kann, hat M. K. Nobles (1948) geliefert. An Hand eines beigefügten Bestimmungsschlüssels ist es möglich, die Identifizierung der isolierten Myzelien durchzuführen.

Bereits J. Liese (1928) wies auf das Verhalten holzzerstörender Pilze gegenüber verschiedenen Holzarten hin und machte darauf aufmerksam, dass es vorteilhaft ist, die erhaltenen Abbauwerte zu vergleichen, da man daraus auf die Leistung der Myzelien in der Kultur schliessen kann.

Cartwright und Findlay (1946) geben in ihrem Buche ebenfalls bei einigen Pilzen die Abbauintensität an.

In den letzten Jahren wurden an meinem Institut an der Hochschule für Bodenkultur in Wien zahlreiche Untersuchungen *) durchgeführt, welche sich mit der Abbauintensität holzzerstörender Pilze befassten. Die Dissertation von Ch. Neustifter (1952), welche

*) Der Österreichischen Gesellschaft für Holzforschung, die durch die Beistellung eines Teiles der erforderlichen Mittel die Versuche unterstützte, sei verbindlichst gedankt. Den Institutsangehörigen, Assistenten Dr. W. Beck und Ing. P. Jenschke, sowie Laboranten, A. Reise und J. Reisenbichler, sei ebenfalls für die geleistete Arbeit gedankt.

unter meiner Anleitung stand, behandelt die Abbauintensität von *Merulius lacrymans* (Jacq.) Fr., *Coniophora cerebella* Pers., *Coriolus versicolor* (L.) Quél. = *Polysticus versicolor* (L.) Fr. und *Ungulina marginata* (Fr.) Pat. = *Fomes pinicola* (Sw.) Cke. Dabei wurden die Versuche so angestellt, dass die Abbauintensität nach dem ersten, zweiten, dritten und vierten Monat getrennt festgehalten wurde. Ferner kamen drei verschiedene Nährböden in Verwendung u. zw. Malz-Pepton-Agar, Malz-Agar und Malz-Holzschliff. Im ganzen wurden auf diese Weise acht verschiedene Holzarten geprüft. Die Versuchsanstellung wurde nach dem Klötzchenverfahren durchgeführt. Der genaue Arbeitsgang ist in DIN-Blatt 52176 vom August 1939 der deutschen Normen festgehalten. Diese Normtestung wurde entwickelt, um Holzschutzmittel zu prüfen. Im vorliegenden Falle wurden aber alle Holzproben ungetränkt eingebaut. Als Kulturgefässe stehen Kolleschalen in Verwendung, die vorher mit Nährboden beschickt und mit dem Myzel des zu untersuchenden Pilzes beimpft wurden. Sobald das Myzel kräftig angewachsen ist, wird die entsprechende Holzprobe eingebaut und ein bis mehrere Monate dem Angriff des Myzeles ausgesetzt.

Ein anderes Verfahren wurde von Leutritz (1946) entwickelt, bei dem als Kulturgefässe gewöhnliche Glasgefässe mit breiter Öffnung und Schraubdeckelverschluss verwendet werden. Diese Gefässe werden nicht mit einem Agarnährboden beschickt, sondern bis zu zwei Drittel ihrer Höhe mit Gartenerde gefüllt, welche die Aufgabe hat, die Feuchtigkeit während der Versuchsdauer zu halten. Auf diese Erde kommt ein dünnes Furnierblättchen oder etwas Sägespäne, damit das abgeimpfte Myzelstück beim Aushyphen ein Nährmedium vorfindet. Sobald der Pilz gut angewachsen ist, wird auch in diesem Falle die Holzprobe eingebaut. Natürlich muss bei beiden Versuchsanstellungen entsprechend steril gearbeitet werden.

Es gibt noch andere Methoden, welche für die Zwecke herangezogen werden könnten, doch sollten bei diesen Versuchen zunächst die wichtigsten Grundwerte gefunden werden.

Zusammenstellung verschiedener Abbauwerte.

In der nachstehenden Zusammenstellung wurden ein Teil der Ergebnisse aus den Arbeiten von J. Liese (1928), Cartwright und Findlay (1946), sowie aus der Dissertation von Ch. Neustifter (1952) und eigene Ergebnisse zusammengefasst. In den Arbeiten der genannten Autoren sind die Mittelwerte festgehalten, während bei den eigenen Ergebnissen der jeweils gefundene Höchstwert verzeichnet wird. Für die Beurteilung der Leistung der Myzelien kommt es nicht auf subtile Unterschiede an. Wir wollen erfahren, kann dieser Pilz in kurzer Zeit einen grösseren Abbau durchführen

oder ist seine zerstörende Tätigkeit an eine lange Zeitspanne gebunden.

Die Aufzählung der Pilze erfolgt alphabetisch mit gleichzeitiger Angabe der Dauer des Versuches und der Abbauintensität, welche den Gewichtsverlust zwischen Ein- und Ausbau in Prozenten ausdrückt. Gleichzeitig ist auch die diesbezügliche Literaturangabe verzeichnet.

Abkürzungen: Die in der Zusammenstellung eingebauten Resultate von Liese (1928)' werden mit (L.), von Cartwright und Findlay (1946) mit (C.F.) und von Neustifter (1952) mit (N.) gekennzeichnet.

Alle jene Werte, denen keine Literaturangabe beigefügt ist, entstammen den eigenen Versuchen nach DIN-Blatt 52176. In den meisten Fällen wurde nach der Kolleflaschen-Methode gearbeitet. Jene Werte, welche an meinem Institut nach der Methode von Leutritz erhalten wurden, sind mit (M-L) gekennzeichnet.

Holzarten, welche öfters untersucht wurden:
Abies alba Mill. abgekürzt A.a.
Acer platanoides L. abgekürzt A.p.
Alnus abgekürzt A.
Fraxinus excelsior L. abgekürzt F.e.
Fagus silvatica L. abgekürzt F.s.
Larix decidua Mill. abgekürzt L.d.
Picea excelsa (Lam.) Lk. abgekürzt P.e.
Pinus nigra Arn. abgekürzt P.n.
Pinus silvestris L. abgekürzt P.s.
Quercus sessiliflora Salisb. abgekürzt Q.s.

Auricularia auricula judae (L.) Schroet. — Dieser Pilz wird bei uns in der Natur häufig auf älteren Hollunderstämmen gefunden. Bei einem Abbauversuch mit einer Holzprobe von *Sambucus nigra* L. und einer Versuchsdauer von 3 Monaten wurde ein Abbau von 4% festgestellt. Dieser Pilz kann als harmloser Holzzerstörer angesehen werden.

Coniophora cerebella Pers. — Die starke Abbautätigkeit dieses Pilzes ist bekannt und wird durch die erhaltenen Resultate übersichtlich festgehalten.

Abbauwerte nach 1 Monat: F.s. 9% (M-L), P.e. 22% (M-L), P.s. 8% (M-L), Q.s. 3% (M-L).

Abbauwerte nach 2 Monaten: F.s. 58% (M-L), P.e. 60% (M-L), P.s. 61% (M-L), Q.s. 10% (M-L).

Abbauwerte nach 3 Monaten: A.a. 51% (N.), A.p. 46% (N.), F.e. 9% (N.), F.s. 64% (M-L), F.s. 62%, F.s. 51% (N.), L.d. 19% (N.), P.e. 60% (M-L), P.e. 70%, P.n. 36% (N.), P.s. 67% (M-L), P.s. 66%, Q.s. 12% (M-L), Q.s. 7% (N.).

Abbauwerte nach 4 Monaten: F.s. 65% (M-L), F.s. 51%, F.s. 33% (L.), P.e. 66% (M-L), P.e. 44%, P.e. 33% (L.), P.s. 62% (M-L), P.s. 49%, P.s. Splint 34 (51)% (L.), P.s. Kern 25% (L.), Q.s. Splint 29% (M-L), Q.s. Kern 6% (L.).

Die erhaltenen Resultate bestätigen die rasche und intensive Abbautätigkeit von *Coniophora cerebella*. Für Vergleichsversuche genügt auch eine 2-monatige Versuchsdauer.

Fomes annosus Fr. — Der Wurzelporling tötet, wie schon sein Name sagt, die Wurzelpartien und den unteren Teil vornehmlich der Fichten ab und gehört zu den gefährlichsten Pilzen, welche die lebenden Bäume angreifen. In Kultur baut der Pilz sehr langsam ab und man kann dies auch bei seiner Tätigkeit in der Natur annehmen, da sonst noch viel grössere Schäden eintreten müssten.

Abbauwerte nach 4 Monaten: A. 1% (L.), F.s. 2,6% (L.), F.s. 7% (C.F.), P.s. Splint 4,5—7% (L.), P.s. Splint 7% (C.F.), P.s. Kern 3% (L.), Q.s. Kern 1,6% (L.).

Fomes fomentarius (L.) Gill. — Die Tätigkeit des Pilzes kann in Buchenwäldern manchmal grössere Schäden auslösen. Auch in diesem Fall braucht der Pilz einige Jahre, bis ein Buchenstamm zerstört ist.

Abbauwerte nach 4 Monaten: F.s. 23% (L.), P.s. Splint 5,3% (L.), Q.s. Kern 3% (L.).

Fomes pinicola (Sw.) Cke. = *Polyporus pinicola* (Sw.) Fr. — Dieser Pilz kann sowohl das Holz von Nadel- als auch von Laubbäumen zerstören. Obwohl der Pilz zuweilen in der Literatur unter zwei verschiedenen Namen (*F. pinicola* und *F. marginatus* Gill.) zu finden ist, handelt es sich um eine Pilzart.

Abbauwerte nach 1 Monat: F.s. 13% (M-L), P.e. 15% (M-L), P.s. Splint 10% (M-L), P.s. Splint 9%, Q.s. 0,4% (M-L).

Abbauwerte nach 2 Monaten: F.s. 36% (M-L), P.e. 32% (M-L), P.s. Splint 45% (M-L), Q.s. 1% (M-L).

Abbauwerte nach 3 Monaten: A.a. 48% (N.), A.p. 39% (N.), F.e. 41% (N.), F.s. 41% (N.), F.s. 59% (M-L), F.s. 61%, L.d. 22% (N.), P.e. 45% (N.), P.e. 56% (M-L), P.e. 62%, P.n. 40% (N.), P.s. 59% (M-L), P.s. 20%, Q.s. 2% (M-L).

Abbauwerte nach 4 Monaten: F.s. 55% (M-L), F.s. 36% (L.), P.e. 59% (M-L), P.s. Splint 45% (M-L), P.s. Splint 40% (L.), P.s. Kern 2% (L.), Q.s. 3% (M-L). Bei diesem Pilz sieht man deutlich, dass die Methode von Leutritz in zwei Monaten bereits deutliche Abbauwerte zeigt.

Lentinus lepideus Fr. — Seine gefährlichsten Zerstörungen kann man immer wieder bei Eisenbahnschwellen und an hölzernen Konstruktionen im Freiland feststellen. Nach meinen bisherigen Erfahrungen ist die Entwicklung des Pilzes auf peptonfreien Nährböden besser.

Abbauwerte nach 3 Monaten: F.s. 19%, P.e. 8%, P.s. 22%, P.s. Splint 20% (C.F.), P.s. Kern 16% (L.).

Lentinus tigrinus (Bull.) Fr. — Man findet diesen Pilz auf Stümpfen der verschiedensten Holzarten. Seine abbauende Tätigkeit konnte bei einem Klötzchen von *Fagus silvatica* nach 3 Monaten mit 50% bestimmt werden.

Lenzites abietina (Bull.) Fr. — Die zerstörende Tätigkeit dieses Pilzes findet man immer wieder im Inneren von Telegraphenstangen und Holzstücken, die in ähnlicher Weise in der Natur aufgestellt sind und Verwendung finden. Erst nach Jahren wird der entstandene Schaden festgestellt, da die Abbautätigkeit nicht besonders intensiv ist.

Abbauwerte nach 3 Monaten: F.s. 20%, P.s. 11%.

Abbauwerte nach 4 Monaten: P.s. Splint 21 (36)% (L.).

Lenzites saepiaria (Wulf.) Fr. — Dieser Pilz ist in seinem Verhalten dem Holz gegenüber *Lenzites abietina* gleichzusetzen.

Abbauwerte nach 3 Monaten: F.s. 10%, P.e. 7%, P.s. 8%.

Abbauwerte nach 4 Monaten: F.s. 11% (L.), P.s. Splint 13% (L.), P.s. Splint 20% (C.F.).

Da auch die beiden *Lenzites*-Arten gegen Pepton empfindlich sind, soll in weiteren Versuchen mit geänderten Nährböden die Abbauleistung erhöht werden.

Merulius lacrymans (Wulf.) Fr. — In zahlreichen Versuchen hat dieser Pilz erwiesen, dass er die Fähigkeit besitzt, rasch und in grossem Ausmasse eingebautes Holz zu zerstören. Seine verheerende Tätigkeit in unseren Häusern ist hinlänglich bekannt.

Abbauwerte nach 1 Monat: F.s. 13% (M-L), P.e. 32% (M-L), P.s. 27% (M-L), Q.s. 1% (M-L).

Abbauwerte nach 2 Monaten: F.s. 34% (M-L), P.e. 42% (M-L), P.s. 50% (M-L), Q.s. 1% (M-L).

Abbauwerte nach 3 Monaten: A.a. 21% (N.), A.p. 17% (N.), F.e. 8% (N.), F.s. 20% (N.), F.s. 29%, F.s. 27% (M-L), L.d. 13% (N.), P.e. 17% (N.), P.e. 53%, P.e. 65% (M-L), P.n. 16% (N.), P.s. 23%, P.s. 50% (M-L), Q.s. 3% (N.), Q.s. 18% (M-L).

Abbauwerte nach 4 Monaten: F.s. 48% (M-L), F.s. 7% (L.), F.s. 4%, P.e. 59% (M-L), P.e. 40%, P.s. Splint 62% (M-L), P.s. Splint 26% (L.), P.s. Kern 6% (L.), P.s. 39%, Q.s. 7% (M-L).

Wie aus der vorliegenden Zusammenstellung zu entnehmen ist, zeigen sich manchmal beachtliche Unterschiede zwischen den einzelnen Testmethoden. Hier muss man dann mit weiteren Versuchen ansetzen, um die Fehlerquelle zu finden.

Merulius silvester Falck.

Abbauwerte nach 4 Monaten: F.s. 6,7% (L.), P.s. Splint 26% (L.), P.s. Kern 6% (L.).

Peniophora gigantea (Fr.) Massee.

Abbauwert nach 9 Monaten: P.s. Splint 20% (C.F.).

Phellinus cryptarum Karst. — Dieser Pilz ist für eingebautes Eichenholz ein gefährlicher Zerstörer.

Abbauwert nach 4 Monaten: Q.s. Kern 10% (C.F.).

Abbauwert nach 4½ Monaten: Q.s. Splint 35% (C.F.).

Pleurotus ostreatus (Jacq.) Fr. — Die zerstörende Tätigkeit dieses Pilzes ist an Laubbäumen zu erkennen. Die Fruchtkörper werden am natürlichen Standort im Herbst gebildet und auch in Kultur genommenes Myzel besitzt eine starke Neigung zur Fruchtkörperbildung.

Abbauwerte nach 3 Monaten: F.s. 35%, P.e. 15%.

Polyporus adustus (Willd.) Quél.

Abbauwerte nach 4 Monaten: A. 33,7% (L.), P.s. Splint 22% (L.), Q.s. Kern 1,7% (L.).

Polyporus brumalis Pers.

Abbauwerte nach 4 Monaten: F.s. 16% (L.), P.s. Splint 5% (L.), P.s. Kern 2%, Q.s. Kern 3% (L.).

Polyporus betulinus (Bull.) Fr. — Obwohl dieser Pilz in der Natur nur auf Birken zu finden ist, besitzt er doch die Fähigkeit, in der Kultur auch andere Holzarten abzubauen.

Abbauwerte nach 3 Monaten: F.s. 45%, P.s. 7%.

Abbauwerte nach 4 Monaten: A. 14% (L.), F.s. 41% (L.), P.s. Splint 32% (L.), Q.s. Kern 7% (L.).

Polyporus hispidus Fr.

Abbauwert nach 3 Monaten: F.e. 10% (C.F.).

Polyporus Schweinitzii Fr.

Abbauwerte nach 4 Monaten: P.s. Splint 17% (L.), Q.s. Kern 0% (L.).

Polyporus sulphureus (Bull.) Fr.

Abbauwerte nach 3 Monaten: F.s. 20%, P.e. 54%.

Abbauwerte nach 4 Monaten: A. 14% (L.), F.s. 15% (L.), P.s. Splint 6,7% (L.), P.s. Kern 0% (L.), Q.s. 16% (L.).

Polyporus vaporarius Fr.

Abbauwerte nach 3 Monaten: F.s. 16%, P.e. 8%.

Abbauwerte nach 4 Monaten: F.s. 37% (L.), P.s. Splint 31—37 (44)% (L.), P.s. Kern 30% (L.).

Polyporus zonatus Nees.

Abbauwerte nach 4 Monaten: A. 33,5% (L.), F.s. 43% (L.), P.s. Splint 10% (L.), P.s. Kern 14,8% (L.), Q.s. Kern 12% (L.).

Polystictus cinnabarinus (Jacq.) Cke.

Abbauwerte nach 3 Monaten: F.s. 66%, P.e. 10%, P.s. 5%.

Polystictus versicolor (L.) Fr.

Abbauwerte nach 1 Monat: F.s. 7% (M-L), P.s. Splint 18% (M-L).

Abbauwerte nach 2 Monaten: F.s. 49% (M-L), P.e. 61% (M-L), P.s. 59% (M-L.).

Abbauwerte nach 3 Monaten: A.a. 49% (N.), A.p. 44% (N.), F.e. 30% (N.), F.s. 55% (N.), F.s. 63% (M-L), F.s. 72%, L.d. 31% (N.), P.e. 54% (N.), P.e. 67% (M-L), P.e. 67%, P.n. 38% (N.), P.s. Kern 7%, P.s. Splint 65% (M-L), Q.s. 3% (N.).

Abbauwerte nach 4 Monaten: F.s. 69% (M-L), F.s. 58%, P.e. 66% (M-L), P.e. 63%, P.s. 68% (M-L), P.s. 58%, Q.s. 3% (M-L).

Poria monticola Murr.

Abbauwerte nach 3 Monaten: F.s. 27%, P.e. 10%.

Poria vaillantii (D.C.) Fr.

Abbauwerte nach 3 Monaten: P.e. 12%, P.s. 8%.

Stereum sanguinolentum (Alb. et Schw.) Fr. — Dieser Pilz verursacht durch den bekannten Rotstreif an Nadelholz auf Lagerplätzen erheblichen Schaden. Seine Abbautätigkeit in der Kultur ist nicht besonders stark.

Abbauwert nach 3 Monaten: F.s. 16%.

Stereum gausapatum Fr.

Abbauwerte nach 4 Monaten: Q.s. Splint 16% (C.F.), Q.s. Kern 4% (C.F.).

Stereum hirsutum (Willd.) Fr.

Abbauwert nach 4 Monaten: Q.s. Splint 15% (C.F.).

Trametes pini (Brot.) Fr. — Manche Kiefernbestände können von diesem Pilz erheblich infiziert sein. Die Fruchtkörper werden erst gebildet, nachdem das Kernholz deutliche Zerstörungserscheinungen zeigt. Die Fruchtkörper sind zumeist an den Astwunden zu finden und besitzen ein sehr langsames Wachstum.

Abbauwerte nach 4 Monaten: P.s. Splint 2% (L.), P.s. Kern 5,8% (L.).

Trametes serialis Fr.

Abbauwert nach 4 Monaten: P.s. Splint 31% (C.F.).

Abbauwert nach 8 Monaten: P.s. Splint 48,8% (C.F.).

Summary.

Experiments have been made to test the intensity of decomposition of some wood-destroying fungi. The obtained results may be regarded as standard figures only. It could be established that the development and growth of the fungi as well as the intensity of the decay is dependent on the nutrient medium and that also the testing method is of importance. Fungi with a quick and intensive decomposition are f. i. *Coniophora cerebella* Fr., *Fomes pinicola* (Sw.) Cke., *Merulius lacrymans* (Wulf.) Fr., *Polyporus betulinus* (Bull.) Fr. and *Polystictus versicolor* (L.) Fr., while f. i. *Fomes annosus* Fr. and *Trametes pini* (Brot.) Fr. couse a slow and weak decomposition.

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Type Studies on Basidiomycetes. VIII.*)

By Rolf Singer (Tucuman, Argentina).

The present series of Type Studies is mainly concerned with type material deposited at the Kew Herbarium (K) and the Cryptogamic Herbarium of the Museum d'Histoire Naturelle Paris (PC). The studies were made possible by a grant received from the American Philosophical Society for which the author is deeply grateful. Some additional analyses are based on material deposited at Gainesville, Fla. (FLAS), New York (NY), Albany, N. Y. (NYS), the Herbarium of Cornell University, Ithaca, N. Y. (CU), the Chicago Natural History Museum (F) and Farlow Herbarium, Cambridge Mass. (FH). It is a pleasant duty to thank the curators and directors of the various institutions mentioned above for their permission to analyse the types. The author wishes to express his special gratitude to Dr. R. W. G. Dennis, Kew Herbarium, for the permission to study his valuable collections from Venezuela and Trinidad as well as the notes and drawings that go with them, for valuable assistance and interesting discussions, and for innumerable courtesies on his part. For the work done in the United States, the author is indebted to the John Simon Guggenheim Memorial Foundation. Without a fellowship from the Guggenheim Foundation, 1952—53, much of the work published here would not have been possible.

The species analyzed are enumerated in the order of the genera to which they belong (classification of the author, 1951) rather than in which they were originally described.

Aphyllophorales.

Campanella Henn.

Marasmius merulinus Berk. & Curt.

Spores 8.8—9.3 ⇌ 6—6.3 μ, nonamyloid, smooth, hyaline to stramineous, ellipsoid; basidia (1)—4-spored, large, clavate, hyaline, sometimes stramineous, 45 ⇌9.3—9.5 μ, clamped at the base;! cystidia none or only a few present, scattered among the basidia and not projecting, hyaline or stramineous, filamentous, 3.3—3.8 μ broad, very inconspicuous; cheilocystidia none; hymenophoral trama and trama of the pileus consisting of filamentous hyphae, running in all

*) Former contributions under the same title were published in Mycologia 34: 64—93. 1942; 35: 142—163. 1943; 39: 171—189. 1947; Lilloa 23: 147—246. 1950 (1952); Sydowia 5: 445—475. 1951; Lilloa 26: 57—159. 1953; Sydowia 6: 344—351. 1952.

directions but mainly applanate-repent and, especially in the lower layer, parallel to subparallel with each other, imbedded in a gelatinous mass, the terminal members of the surface sometimes swollen or more frequently thinned out and with inconspicuous branchlets and short spine-like processes, some at a right angle although there is no definite layer with *Astrostromella*-structure, subhymenium ramose and less gelatinous than the trama.

This is authentic material preserved at FH, Wright, Pl. Cub. Wright. no. 133. It is a *Campanella,* **C. merulinus** (Berk. & Curt.) Sing. comb. nov.

Favolaschia (Pat.) Henn.

Laschia antarctica Speg.

Spores 9.5—11 ⇌ 6.8—8.3 μ, amyloid, smooth, without suprahilar applanation or depression, globose-short-ellipsoid or short-ellipsoid; basidia long; among the basidia in the hymenia some basidiomorphous gloeocystidia; gloeocystidia also present, as well as gloeo-vessels, in the upper layer of the pileus and on the pileus surface, but not many reaching the surface and then cystidioid, clavate, about 8—8.5 μ thick or narrower, these as well as the gloeo-vessels strongly deep blue in cresyl blue mounts; dendrophyses on pileus surface and in marginal position, hyaline, some with a pale fuscous dissolved intracellular pigment (this may be the cause of the darkening of the carpophores), cylindrical or cylindric-clavate, or tennis-racket-shaped to clavate and then up to 16.5 μ broad, with spinules of somewhat variable size, mostly 1—2 μ long, some to 3.5 μ, but generally less strongly echinate than in *F. echinata,* without an amyloid body inside; hyphae of the upper layer of the pileus gelatinized; with clamp connections, nonamyloid. The pileus is white, but becomes spadiceous in the herbarium, with distinct lateral pseudostipe.

This is the type from Staten Island, Tierra del Fuego. Argentina, NY. The difference between this species and *F. echinata* (which is very close) is evident because of the better developed pseudostipe, the sligtly shorter spinules of the dendrophyses, the absence of an amyloid body inside the dendrophyses, the slightly smaller pilei and smaller pores. The new combination **Favolaschia antarctica** (Speg.) Sing. is herewith proposed.

Favolaschia auriscalpium (Mont.) Pat.

Spores about 10 ⇌ 6.5 μ, smooth, amyloid; gloeocystidia none; dendrophyses none; there are, however, in place of dendrophyses, large smooth spherocysts all over the surface portions of the carpophore; all elements hyaline in NH_4OH.

This in the type, Leprieur 691, from French Guyana (PC) and corresponds closely to Montagne's description even including the smooth cells of the surface, a feature practically discounted as an error by most authors, and the assumption that "this is not an

orange species as they seem to think in Berlin" (Lloyd) seems to be correct after all. This is a very distinctive species among the representatives of section *Anechinus* Sing. It is not, as I believed formerly, either the same as *F. flava* or *F. sabalensis*. It is not even related with these species.

Laschia longicellulis. Lloyd, Mycol. Notes **5**: 837. 1919.

Spores 7.5 ⇌ 5.3 μ, amyloid, smooth; basidia 26—32 ⇌ 8.5—9.5 μ; gloeo-vessels and gloeocystidia very numerous, in cresyl blue with very thin almost indistinct walls and strongly bluing and guttulate; dendrophyses present, the majority strongly vesiculose, 23—31 ⇌ 9.5—22 μ, few thin and subcylindrical (about 5 μ diam.), all without contents of any kind, spinules 1.3—2 μ long, more often about 1.3 μ than 2 μ.

This is the type from the Lloyd Herbarium (BPI), kindly sent by Dr. Stevenson. It is apparently a synonym, not of *F. saccharina* but of *F. pygmaea* (Speg.) Sing. (cf. Lloydia 13: 254. 1950).

Agaricales: Hygrophoraceae.

Camarophyllus Kummer.

Hygrophorus umbrinus Dennis.

Spores globose, hyaline, smooth, nonamyloid, 4.7 ⇌ 4.5 μ; basidia 42 ⇌ 6—7.3 μ (the 4-spored ones), and 4.3 μ broad (the 2-spored ones); hymenophoral trama with irregularly interwoven lateral stratum and more axially arranged mediostratum, the latter pale melleous-umbrinous, the former hyaline; cuticular hyphae densely interwoven and irregular, 3 μ in diam., with umber mebranal pigment; all hyphae with clamp connections.

This is a good *Camarophyllus* although the deeper colored more regular central strand of the hymenophoral trama may suggest a *Hygrophorus* s. str. It would be necessary to have still younger material in order to be certain that the lateral stratum is never divergent. But all other characters seem to agree with *Camarophyllus*.

Hygrophorus hymenocephalus Sm. & Hesler sensu Dennis.

Spores 5.7—5.8 ⇌ 5.2 μ, hyaline, nonamyloid, smooth; basidia 23—29 ⇌ 5.5—6 μ; hymenophoral trama stramineous, consisting of hyphae of unequal diameter, some rather broad (to 11 μ), with sometimes slightly thickened walls (to 0.4 μ), showing a distinct axillar arrangement but somewhat interwoven; subhymenium of small elements present; epicutis above strands of repent filamentous hyphae formed by a hymeniform layer of vesiculose pedicellate cells; all hyphae nonamyloid, with clamp connections.

This is the collection from Trinidad (K) representing Dennis's interpretation of the North American species. I have also studied the type of the latter (MICH) and, because of the relatively somewhat shorter basidia and the absence of clamp connections, inserted it,

together with some other clampless *Camarophylli,* in the genus *Armillariella* inasmuch as I am convinced that the less irregular trama of this group, intermediate between that of *Camarophyllus* and *Hygrocybe,* shows that it is generically different from both these genera. While this latter statement seems to be correct, it was A. H. Smith's opinion that the species concerned should not be removed from the *Hygrophoraceae**). Dennis' species, differing from the original type only (as far as important characters are concerned) in the presence of clamp connections, seems to decide the controversial subject in favor of A. H. Smith's opinion. Until and unless a new generic name is proposed for the species with either hymeniform epicutis or clampless hyphae (or both), no new name is proposed for the tropical species, analysed above.

Hygrophorus nodulisporus Dennis.

Spores 9.8 ⇌ 7.5 μ, hyaline, with projecting subcylindric to long-conical spines (about ten in optical section), nonamyloid; basidia 38—57 ⇌ 9—9.5 μ; hymenophoral trama with a central strand of fuscous non-gelatinous slightly interwoven hyphae, and a hyaline lateral stratum consisting of thin filamentous hyphae, ± diverging toward the hymenium, and imbedded in a gelatinous mass; hyphae of the epicutis repent and filamentous, with a very slight pigment incrustation on the walls of some hyphae; all hyphae without clamp connections.

This is the type from Trinidad, a very distinctive species (K), undoubtedly a representative of the *Hygrophoraceae,* but differing from all other known *Hygrophoraceae* in stellate spores; in addition, this species has another unique correlation of important characters, viz. bilateral trama and hyphae without clamp connections. Under these circumstances, it appears to represent a thus far monotypic tropical genus of the family *Hygrophoraceae* which we propose to recognize as a new genus:

Hygroaster Sing. gen. nov.

Hygrophoracearum genus; lamellis crassiusculis; velo nullo; tramate hymenophorali bilaterali; hyphis omnibus defibulatis; sporis stellatis. Typus generis: **Hygroaster nodulisporus** (Dennis) Sing. comb. nov. (*Hygrophorus nodulisporus* Dennis).

Tricholomataceae.

Clitocybe Kummer.

Omphalia bicolor Baker & Dale, Comm. Mycol. Inst. Mycol. Pap. 33: 91. 1951.

The type is in good condition. Spores 4.5—5.2 ⇌ 3.8—4.5 μ, hyaline, smooth, inamyloid; epicutis of the pileus consisting of smooth, repent,

*) Cf. also Sydowia **8**: 304, 1954.

hyaline to melleous, non-incrusted hyphae; all hyphae non-gelatinized, non-amyloid, with clamp connections.

This is the type from Trinidad, (K). The macroscopical characters of this characteristic species, together with the data obtained from the type, show clearly that Dennis was correct in transferring the species to *Clitocybe*. Whether or not this can be done in the form proposed by Dennis as *Clitocybe bicolor* (B & D) Dennis depends on the nomenclatorial status of Murrill's "new combinations" given as an appendix to his descriptions of new species in American Code nomenclature. The author is inclined to believe that these combinations should be considered as validly published rather than alternative names, and, consequently, considers *Omphalia bicolor* B. & D. as a homonym of Murrill's binomial. The new name **Clitocybe ferrugineoalba** Sing. nom. nov. is therefore proposed for Baker & Dales's species.

Omphalina cylindrospora Dennis, Kew Bull. for 1952: 494. 1952.

Spores 8—10.3 ⇌ 3—3.2 μ, smooth, nonamyloid, thin-walled, rod-shaped, hyaline; cystidia none; hymenophoral trama of thin-walled, somewhat irregular hyaline non-gelatinous hyphae, with a few slightly thickwalled (about 0.5 μ) ones intermixed; cuticle of pileus macroscopically innately radially fibrillose, consisting of parallel, partly voluminous elongated hyphae, most with a fuscous cell sap, some with fuscous incrustations, repent, thin-walled, smooth, and on top of this structure some erect or ascendant swollen cells, vesiculose bodies, etc., but not forming a continuous layer, also with umber dissolved intracellular pigment; basidia 4-spored; all hyphae non-amyloid, narrowly filamentous to very broad, thin-walled, with a few very slightly thicker walled ones (0.5 μ) intermixed, with clamp connections. The pileus is deeply umbilicate.

This species, the type of which (K) corresponds to the data indicated above, is marginal both in *Clitocybe* and *Gerronema*, although a whole series of species with somewhat irregular trama are known in *Clitocybe* where they seem to have close affinities with more typical species; on the other hand, the radially fibrillose pileus and the characters of the hyphae as well as the habit of the carpophores agree well with *Gerronema* (such species as *G. elasticum*), but it differs in the presence of non-intracellular pigment. Even though there can be little doubt but that this species is not congeneric with *Omphalina*, I prefer to refrain from a transfer at this time, waiting for more data which might make a decision easier in the future.

Collybia Kummer.

Marasmius subprasiosmus Murr., Bull. Torr. Bot. Cl. **67**: 153. 1940.

Spores 6.8—7.3 ⇌ 3.5—4 μ, smooth, nonamyloid, hyaline; basidia 4-spored; cheilocystidia none seen; epicutis consisting of filamentous smooth, parallel hyphae which form a cutis.

The type collected on a law in northern Florida (FLAS), is well preserved. The species is extremely close to *Collybia cauvetii* (R. Maire) Sing. (*Marasmius cauveti* Mre.), and differs slightly in the manner of striation of the pileus, localization of the pigment, and habitat. It is not related with *M. prasiosmus*.

Collybia brunneosetosa Dennis.

The type, no. 221 (K) has an epicutis of hyaline, strongly deep brown incrusted repent hyphae, forming a cutis; there are occasional very distant slight bulges and nodules and the walls are at places roughened but neither diverticulate nor showing *Rameales*-structure; clamp connections present.

This is therefore a characteristic species of the genus *Collybia* sensu str.

Marasmius coracicolor Berk. & Curt.

Spores few (among innumerable mould conidia) hyaline, smooth, with or without subprahilar depression, ellipsoid, about 5.5 ⇌ 3.8 μ; cystidia none; epicutis of pileus consisting of appressed, smooth hyphae; some broader thicker walled elements in the hypodermium, but none of these with incrusting pigment.

This is the type, Wright 10, (FH), from Cuba. It must be called *Collybia coracicolor* (B & C) Dennis. The pileus of the type is now brown, lamellae tan color, stipe brown with a lighter colored thin velvety-tomentose covering, equal; lamellae close, adnexed, medium broad; pileus striate-sulcate now, quite glabrous, roughened only partly by drying.

Marasmius pulchellus Berk.

Spores not seen; basidia apparently small; epicutis of pileus of smooth hyphae with a brown to melleous incrusting pigment. The pileus is broadly campanulate, cinnamon, with striate-sulculate margin, in dried condition less, in soaked condition more than 10 mm broad; the stipe is very thin, brownish, slightly pruinose, especially at apex, equal; lamellae subclose, adnexed, not very broad, close; hyphae non-amyloid, with clamp connections.

This is the type, Spruce no. 99 of which there are three mounts of carpophores (K) which seem to be identical with each other. This is a *Collybia*, **C. pulchella** (Berk.) Sing. comb. nov.

Paxillus retiarius Berk.

Spores 5.3—6 (6.5) ⇌ 3—4.5 μ, nonamyloid, smooth, hyaline; cystidia none; hymenium now yellowish; epicutis of elongated, smooth, hyphae, not with *Rameales*-structure, with an occasional side-branchlet, but never diverticulate. Base with mycelial strigose fibers which are white; hyphae non-amyloid, with clamp connections.

This is the type, Spruce 611, (K), from "Panuré" (Ipanuré = São Jeronimo), Brazil. The lamellae are strongly intervenose and almost subporoid, and thus remind one of *Collybia plectophylla* (Mont.) Sing. Since the type of the latter (FH) which is the lectotype material of the holotype, did not yield any spores, it is not impossible that it actually belongs to the small-spored species, described as *Paxillus retiarius* by Berkeley. However, as long as it has not been proved that *P. retiarius* occurs in French Guyana where Leprieur collected while *C. plectophylla* sensu meo does not, I feel that my interpretation should stand. The interpretation of the Montagne species given by Heim and Dennis refers to a *Mycena* and may or may not be represented in the original assemblage of material, yet it does not correspond with the lectoholotype. On the other hand, it seems that *Marasmius argentinensis* Speg. with spores 6.8 ⇌ 3—4.3 μ might be the same species as that described by Berkeley as *Paxillus*. The latter should be known as **Collybia retiaria** (Berk.) Sing. comb. nov.

Marasmius semisquarrosus Berk. & Cooke.

The type specimens at K are identical with those of *Marasmius spongiosus* Berk. & Curt. which is *Collybia spongiosa* (Berk. & Curt.) Sing. (= *Marasmius semihirtipes* Peck). It comes from Gainesville Fla., where I have collected it frequently since it is one of the commonest Collybias there.

Gerronema Sing.

Omphalina euomphalus var. *lutea* Dennis.

All macro- and microscopical characters of the type (K) coincide closely with the characters of *Marasmiellus icterinus* Sing. However, in view of the new genus *Gerronema,* it seems best to transfer the species of *Marasmiellus* sect. *Xanthophylli* Sing. to *Gerronema,* inasmuch as this makes it easier to separate the mycenoid species of *Marasmiellus* from the marasmioid ones, if such a separation (of *Marasmiellus* sensu str. and *Hemimycena*) is desired. The new combination **Gerronema icterinum** (Sing.) Sing. (*Marasmiellus icterinus* Sing., *Omphalina euomphalus* var. *lutea* Dennis) is proposed.

Tricholoma Kummer.

Tricholoma glaucoalbum Sing., Sydowia **2**: 28. 1948.

A comparison of the type with certain collections made by the author in 1953 in northern Michigan seems to show that a continuous series of forms connects *Clitocybe odora* with *Tricholoma glaucoalbum.* Under these circumstances, it seems best to transfer this species to *Clitocybe,* without giving it a binomial in that genus inasmuch as further monographic studies must show whether it can be specifically separated from *Clitocybe odora.* As a logical consequence, the section *Glaucoalba* Sing. and the subgenus *Fibulocutis*

Sing. in *Tricholoma* should be abandoned. In view of the data given under *Hygrophoraceae* (above), it is also probable that the section *Marginata* Sing. and the subgenus *Humidicutis* Sing. in *Tricholoma* should be abandoned, but no definite arrangements for the species concerned can be made as long as they cannot be disposed of in the family Hygrophoraceae, a situation which will be dealt with in a forthcoming paper.

Tricholoma acre Peck.

Melanoleuca subacris Murr., Lloydia **5**: 142. 1942.

The types (NYS and FLAS, respectively) of both these species refer to the same species, rather frequent in the United States, and characterized by slowly acrid taste and 6—8.7 (11.5) ⇌ 4—6 μ large nonamyloid spores, the presence of versiform cheilocystidia, and a cutis of parallel, septate, non-incrustated cylindrical hyphae (rarely with some subhyaline incrustations). There is also material collected by the author and compared with topotypic and authentic (same collector, G. E. Francis, no. 89, from Worcester, Mass., FH) material from which some chemical reactions of the flesh were obtained: Phenol: negative. $FeSO_4$: negative. Metylparamidophenol strongly positive (deep purple). This material was gathered at Harvard, Mass. Oct. 5, 1946 in a mixed wood of *Betula, Tsuga* and *Pinus*. The pileus was "piping rock" to "traprock" (M & P). It is preserved at FH.

Melanoleuca adusta Murr., J. El. Mitch. Soc. **55**: 370. 1939.

Spores 5—6.8 ⇌ 3.5—3.8 μ, smooth, hyaline, with very thin wall, with one oil droplet, nonamyloid; basidia 24 ⇌ 6.7 μ, 4-spored; cystidia none; hyphae of cuticle repent and subparallel with brown walls but without incrusting pigment, often contracted at septa; hyphae nonamyloid, without clamp connections.

The type (FLAS) is a typical *Tricholoma* in spite of its small size.

Porpoloma Sing.

Tricholoma griseum Dennis.

Spores 7.2—7.3 ⇌ 4.5—4.8 μ, amyloid, smooth, hyaline, thin-walled, smooth, ellipsoid; pleurocystidia 44—45 ⇌ 6.5—10.5 μ, hyaline, thin-walled, only rarely apex somewhat thick-walled, long-subclavate or cylindrical with or without subcapitate apex; cheilocystidia numerous, broadly cylindrical to subventricose; epicutis of pileus consisting of parallel repent hyphae forming a cutis, occasionally a strand of parallel hyphae subascendant and then the terminal hyphal cell shortened, subellipsoid; pigment incusting the epicuticular hyphae; hymenophoral trama consisting of parallel, hyaline, thin-walled, nongelatinous filamentous hyphae, regular; all hyphae with clamp connections, nonamyloid.

This is the type (K). It comes close enough to the subantarctic genus *Porpoloma* but differs from the species of that genus in the

presence of pleurocystidia. It differs from all species of *Tricholoma* by having distinctly amyloid spores, pleurocystidia, and clamp connections in a non-interwoven pileus cuticle. The final generic position of this fungus must be left undecided for the time being.

Dermoloma (Lange) Sing.

Tricholoma atrobrunneum Dennis.

Spores 5.3 ⇌ 4.5 μ, amyloid, smooth, hyaline, short-ellipsoid; basidia 4-spored; cystidia and cheilocystidia none; hymenophora trama regular, of parallel filamentous hyphae; epicutis of the pileus formed by an epithelium consisting of a single layer of globose to subglobose pedicellate cells, hymeniform, the cells fuscous from a membrana pigment and slightly incrusted in places, all hyphae hyaline, smooth, filamentous an trama, with clamp connections.

The type (K) is a good representative of the genus *Dermoloma*, a genus close to *Cantharellula* and *Porpoloma*, and characterized by its amyloid spores, absence of cystidia and cheilocystidia, presence of an epithelium and clamp connections. The type species of the genus is *Tricholoma cuneifolium* (Fr.) Gill. sensu Lange which is apparently also the same as that of Josserand and Kühner & Romagnesi. The new combinations **Dermoloma atrobrunneum** (Dennis) Sing. and **Dermoloma cuneifolium** (Fr.) Sing. are proposed. The genus was at first accepted ad interim in Lilloa **22**: 250. 1949 (1951), but should be accepted definitively.

Hohenbuehelia Schulz.

Agaricus (Crepidotus) phalliger Mont.

Spores ellipsoid to somewhat saussage shaped, 8—9 ⇌ 3.5—4.2 μ, hyaline, smooth, nonamyloid, thin-walled; cheilocystidia versiform (subcylindrical, subcapitate, or ampullaceous) with transitions to the metuloid type; metuloids numerous, strongly incrusted with crystals especially at the apex, obtuse or with a neck-like outgrowth at the apex, more rarely acute, stramineous, 35—42 ⇌ 7—16 μ, with very thick walls. The surface looks somewhat like that of *H. atrocaerulea* with which it is undoubtedly most closely related, in the back region particularly distinctly fuzzy-rough on darker ground; lamellae close but not crowded and narrow, entire.

This is part of the type, the „3me envoi" from Valdivia, coll. Gay (PC). There is also the second „envoi" which is identical. The data given above show that this is the same species as the one described by Singer & Digilio under this name (Lilloa **25**: 114. 1951).

Asterotus Sing.

Panus sprucei Berk.

Panus bicolor Mont.

Spores 6.5—7.3 ⇌ 3.3 μ, smooth, hyaline, nonamyloid; basidia normal; cystidia none; hyphae imbedd in gelatinous mass; in hymeno-

phoral trama equally gelatinized as in trama of pileus, with a non-gelatinized subhymenium and a non-gelatinized subhypodermial layer above which there is a homogeneous cuticle of typical astrostromelloid structure as seen in *A. dealbatus.* Lamellae now neutral gray to deep brown, with brownish stipe, and now dull gilvous whitish (but originally, when fresh, "lividus, siccicate gilvus albescens", according to collector's notes, *Panus sprucei*) pileus which is sulculate and glabrous at margin and velutinous and depressed behind; lamellae narrow and deeply decurrent.

P. sprucei (K) comes from São Jeronimo (Panuré), and *P. bicolor* (PC) from French Guyana. They are identical with each other, and belong to *Asterotus* Sing. The new combination **Asterotus bicolor** (Mont.) Sing. is proposed.

Phyllotopsis (Gilb. & Donk) Sing.

Tilotus lenzitiformis Kalchbr., Grevillea **9**: 137. 1881.

The type (K) is undoubtedly an agaric. It was collected at the Cape, McOwen 1401, and has now an annotation by "GWD" stating that it is *"Claudopus nidulans"*. Macroscopically, this determination seems to be probable. On the other hand, the specimen does not contain any spores except a few (perhaps of foreign origin) which are shorter than those of *P. nidulans.* The description given by Kalchbrenner is inaccurate. The lamellae are entire and glabrous, not in any way remarkable. The tomentum exists but between the pilei. This was "not yet studied out" and apparently prematurely published, and is, as far as the original description is concerned, a "nomen subnudum ad int". However, Saccardo published the same text again without making it appear that it was a provisorium. If it is considered that Saccardo validated the description and if it may be considered permissible to identify this exotic species without spores as *Phyllotopsis,* then one may argue that *Tilotus* antedates *Phyllotopsis.* Since the answer to both these questions is not likely to be in the affirmative, I refrain from making any further comments.

Pleurotus Kummer.

Panus levis Berk. & Court.

Since older carpophores of this species are naked and show no trace of a veil, it may be of interest that the type specimens at Kew do show traces of a veil. This proves that the species described by Kauffman as *Pleurotus corticatus* is actually *Pleurotus levis* (B&C) Sing. Fresh material (from Douglas Lake, Cheboygan Co., Mich., coll. & det R. Singer, F) has pale cream colored (between A and B of Crawshay) spore print.

Pterophyllus bovei Lév.

The type from Egypt is preserved at PC and a fragment also at K. Bresadola left an annotation saying that this is a *Pleurotus* rather

than a new genus. It looks very much like a true *Pleurotus* but the anatomy of the lamellae is hard to establish since they are somewhat damaged by insects, a feature that also caused the slight thickennings at the edge which caused Léveillé to describe it as a new genus. It is supposed to be identical with *Agaricus fici* Lév. The generic name *Pleurotus* is not in nomenclatorial danger since it is one of the nomina conservanda.

Panus concavus Berk.

The type from Santo Domingo exists in two portions (or more), constituting the type collection. The holotype is preserved in the Berkeley Herbarium (K) and syntypes were sent from the Boissier Herbarium to Patouillard and came with the Patouillard Herbarium to Harvard (FH). Both portions are identical with each other and were carefully studied since they are the type not only of this species but also of the genus *Lentodiellum.*

Spores (5.5)6.7—7.7(8) ⇌ (1.7)2—2.5(2.7) μ, hyaline, cylindrical or cylindrical-oblong, smooth, non-amyloid, with a flat inner side or with suprahilar applanation or depression; basidia 23—24 ⇌ 4—4.5 μ; cystidia none; occasional cystidioid hyphae breaking through the hymenial layer, and occasional basidioles transformed into fusoid cystidioles; subhymenium very distinct, brownish pallid, strongly taking up dye, irregularly interwoven, consisting of small filamentous elements; hymenophoral trama not sharply divided into a medio- and lateral stratum, but near the subhymenium definitely showing an exillar trend, consisting of rather thin strongly interwoven hyphae, further toward the central strand more and more irregular, running in all directions, strongly interwoven, and often more or less thick-walled; all hyphae non-amyloid, with clamp connections, some thin-walled, some definitely thick-walled. The base of the stipe is not too well preserved in the FH portion (broken off) and little better in the K portion. No veil could be seen. The lamellae are close but not very close, crowded.

The genus *Lentodiellum* is based on this species. Since the analysis of the type shows the latter to be a *Pleurotus, Lentodiellum* becomes a synonym of *Pleurotus.* On the other hand, a very similar but obviously different species was described as *Lentodiellum concavum* by Dennis (Kew Bull. 1950: 332. 1950). The material on which this description was based (K) is in excellent condition. It differs from *Panus concavus,* type, in having crowded lamellae, a common scaly white base from which about a dozen individual stipes and pilei arise; habitat on a manure heap. Spores much smaller and relatively broader than in the type, 4.7—5.2 ⇌ 2.2—3 μ, hyaline, smooth, non-amyloid; basidia 20 ⇌ 3.8 μ, 4-spored, cystidia none; subhymenium poorly developed, practically absent; hymenophoral trama consisting of thin-walled, filamentous, slightly interwoven hyphae,

hyaline, non-gelatinized, regular or subregular; cuticle of the pileus dense, consisting of smooth filamentous hyaline hyphae; all hyphae with clamp connections, non-amyloid.

Since this is not identical with *Panus concavus,* it has to be renamed. It is certainly a *Clitocybe,* but not identical with any of the pleurotoid Clitocybes known, such as *Clitocybe pleurotus, C. aberrantissima,* etc., but it may hide under Rick's *„Pleurotus fimbriatus* Bolton" which, however, is not polypilous or fimicolous. We redescribe it as *Clitocybe augustinensis* in a forthcoming paper.

On the other hand, we believe the type collection to be a good species of *Pleurotus,* and transfer *Panus concavus* Berk. to *Pleurotus* as *P. concavus* (Berk.) Sing. (*Panus concavus* Berk., Ann. Mag. Nat. Hist. II, 9: 194. 1852). This species is undoubtedly very close to *Pleurotus hirtus* (Fr.) Sing. (See Type Studies on Basidiomycetes V, Sydowia **5**: 446. 1951), but differs in being glabrous. It does not show much similarity with *Pleurotus prometheus* with which it would key out. If Murrill, who attributes a veil to this species, were right, one may also compare *Pleurotus sajor-caju* (Fr.) Sing. and *Pleurotus rickii* Bres. However, the first one has a different aspect in dried condition, and seems to be restricted to the Old World tropics, while the latter differs in the color of the pileus. There is, however, no evidence that the typical *Pleurotus concavus* ever has a veil.

Lentinus Fr.

Agaricus boryanus Berk. & Mont., Ann. Sciences Nat. Bot. ser. 3, **11**: 235. 1849.

Spores none seen; basidia small, clavate, 17.5 ⇌ 3 μ, 1-, 2-, 3- and (mostly) 4-spored; cystidia none; hymenophoral trama regular, consisting of broad (to 14.5 μ), mostly thick-walled filamentous hyphae (wall e. gr. 2 μ thick); subhymenium poorly developed and very thin; trama of pileus irregularly arranged and more or less gelatinized, consisting of thick-walled hyphae; epicutis nongelatinized, consisting of denser thinner hyphae; some of the hyphae seem to adsorb iodine from the Melzer on the inner surfaces of the walls, but only very slightly so, nonamyloid, with clamp connections; basidioles often subampullaceous (cystidioles?). Macroscopically very similar to the type of *Lentinus cubensis.* Lamellae crowded; stipe rather hard, tending to dark brown below, lamellae tending to separate from apex of stipe, stipe slightly eccentric, subinsitious.

This is the type from Bahia, Brazil, (K). In spite of the fact that the gelatinization of the pileus trama has not been observed in North American material, I think the original description, the data given above, and the aspect of the carpophores preserved corroborate Murrill's opinion about the identity of *A. boryanus* with *Lentinus cubensis.* Consequently, Montagne's epithet having considerable

priority, I propose the new combination **Lentinus boryanus** (Berk. & Mont.) Sing.

Agaricus ixodes Mont., Ann. Sc. Nat. ser. 4, **1**: 95. 1854.

Spores 5.5 ⇌ 2.5 µ, hyaline, cylindrical, nonamyloid, smooth; basidia small, clavate; cystidioles fusoid, acute, inconspicuous; hymenophoral trama consisting of thin and thinwalled, often sligthly spiralling wavy hyphae which generally run in axillar direction, but later (FH material) intermixed with thickwalled mostly subparallel hyhpae which are no more than subgelatinous (where the thick-walled hyphae are few or absent, the trama may be termed gelatinous); pileus trama also gelatinized but here hyphae running in all directions; cuticular layer definitely not gelatinized, consisting of smooth, filamentous, thin hyphae, dense. When compared macroscopically with *Lentinus cubensis,* it appears to be identical. All hyphae are nonamyloid, with clamp connections.

This is the type, Leprieur no. 982, FH, K. The specimen analysed in the Kew Herbarium seems to be sligthly younger than the one from the Patouillard Herbarium (FH). The latter is almost indistinguishable from the type of *A. boryanus.* We draw the conclusion that young specimens of this species (*Lentinus cubensis,* or — recte — *Lentinus boryanus*) have a tendency to be strongly gelatinous in young hymenophoral trama, and more or less gelatinous in the pileus trama. The surfaces are never gelatinous, and the carpophores of *A. ixodes,* type, could not possibly have been glutinous even in youth. I consider *A. ixodes* as a synonym of *Lentinus boryanus.*

Panus leprieurii Mont., Ann. Sc. Nat. IV, ser. 1: 121. 1854.

The part of the type, deposited in the Patouillard Herbarium, FH, is obviously the same as *Lentinus boryanus,* only somewhat discolored and smaller.

Oudemansiella Speg.

Agaricus radiculosus Cooke.

The type, Glaziow 9149, from Rio de Janeiro, has all the micro- and macroscopical characters of *O. canarii* and is a synonym of the latter. This observation coincides with an annotation by Dennis, who also found *Tricholoma albosquamatum* Beeli to be synonymous with this pantropical species. These two additional synonyms have to be added to the list already given by the author (Mycologia **37**: 437—437. 1945, with description of *O. canarii*). Further type studies see Lilloa **23**: 185. 1950 and **26**: 67. 1953.

Agaricus napipes Hook. fil.;

Agaricus olivaceoalbus Cooke & Maas.

The two species are certainly identical with each other, and have the suddenly thinned pseudorhiza, the large size of the carpophores, and the large size of the spores in common:

Spores 16—21.8 ⇌ 10—13 μ, hyaline to pale stramineous, smooth, rather thickwalled to thin-walled, nonamyloid; basidia and cystidia as in *O. radicata*. Epicutis hymeniform. Clamps present.

The type of *A. napipes* (from Sikkim, K) and that of *A. olivaceo-albus* (Wehl no. 3, under Casuarinas, Lake Bonney, S. Australia, K) are also identical with a specimen collected by L. W. White in Cambridge Mass. This as viscid, very large, with very thin pseudorhiza on a grassy lawn on buried wood, June 25, 1942, with odor of *Palargonium* leaves, but with spores only 16—18 ⇌ 10—11.5 μ. I do not think that the three are different from *O. radicata* unless the latter is split up into microspecies.

Agaricus alveolatus Kalchbr.

Spores with rather thin walls, subhyaline, 14.5—17.5 ⇌ 10—13 μ; basidia and cystidia as in *O. radicata*, melleous-hyaline, the latter e. gr. 42 ⇌ 17.5 μ.

The type was collected by McOwen at the Cape of Good Hope, South Africa, K. This is a synonym of *O. radicata*.

Hygrophorus gigasporus Cooke & Mass.

Spores 12.3—15.3(21) ⇌ 10.3—11.7(15) μ, otherwise as above.

The type from Port Philipp, coll. French (K) is synonymous with *O. radicata*.

There is, however, in New Zealand, a similar form but with spores subglobose, smooth, hyaline, thin- to thick-walled, 13—15.3 ⇌ 11—13.5 μ, i. e. markedly shorter than in the European and North American *O. radicata*; basidia 45—52 ⇌ 13—14.3 μ; otherwise I could not discover any appreciable difference from *O. radicata* and the species analysed above. This is a specimen deposited at the Kew Herbarium with the determination „*Pluteus phlebophorus* Ditm. prox." Whether this should be treated as a variety of *O. radicata*, or as a new species cannot be decided at the present time.

Xerula R. Maire.

Agaricus aureotomentosus Kalchbr. in Kalchbr. & Cooke, Grevillea **9**: 17. 1880.

The type of this species from Port Natal (PC) seems to be identical with *Xerula chrysopepla* (Berk. & Curt.) Sing. This species appears to have a similar distribution as compared with *Heimiomyces tenuipes*.

Mycenella (Lange) Sing.

Collybia mycenoides Dennis.

Spores 8 ⇌ 4.8 μ, smooth, hyaline, with moderately thin walls, nonamyloid, broadest in the hilar region with rather strongly developed hilar appendage but not so strong as in most Mycenellas, tapering toward the rounded apex, with a slight suprahilar depression; cystidia ventricose below, ampullaceous with rounded apex which

is thin-walled, otherwise remarkably thick-walled (wall 3 μ thick), about 66 ⇌ 20.5 μ, pedicellate, very slightly amyloid, beautifully metachromatic in cresyl blue mounts, viz. rose-purple except for the (thinner walled) apex and base which are weakly metachromatic; hyphae of the trama hyaline, with clamp connections, very weakly amyloid to nonamyloid, slightly metachromatic cresyl blue mounts but still strongly contrasting with the thick-walled portion of the cystidia; epicutis of pileus consisting of ascendant to more rarely erect hyaline to umber, broad-cylindrical, cystidioid bodies emerging at intervals from the cutis which forms the hypodermium consisting of rather voluminous hyphae with deep umber cell sap, somewhat interwoven to subparallel, beneath more densely packed and non-gelatinized, pigment-less, and sometimes sligthly thick-walled.

The type from Trinidad (K) has the aspect of a *Mycena,* as is also expressed in the specific epithet chosen by Dennis. The characters of this species make it very difficult to dispose of it in a satisfactory way. Since the only species known to me and showing a comparable structure is, in view of its subglobose to globose spores a true *Mycenella* (in spite of the absence of spore ornamentation), I believe that, at present, this species should be considered a *Mycenella* also.

Marasmiellus Murr. *)

Marasmius alliiodorus (Bertero) Fr.

Spores none seen; cystidia none on sides of lamellae; epicutis of pileus with distinct *Rameales*-structure. Lamellae somewhat intervenose in some carpophores, white, distant or subdistant, adnate to decurrent. Stipe with equal or sligthly attenuated base, whitish to (especially below) brownish (not gray-brown), subpruinose, glabrescent, insititious on fallen branches.

There are three collections, two from San Juán Fernandez (one of these from the Montagne Herb., one from the Hooker Herbarium), and one from San José, Valdivia, Chile. All three seem to be identical. The species belongs undoubtedly to *Marasmiellus* and the combination **Marasmiellus alliodorus** (Bertero) Sing. is proposed.

Marasmius atroviridis Ber. & Curt., J. Linn., Soc. Bot. **10**: 295. 1869.

Spores short ellipsoid, 5—7.5 ⇌ 4—6 μ, hyaline, smooth, nonamyloid; hyphae of the regular gill trama nonamyloid; hypnae of the poorly preserved epicuticular layer possibly of *Rameales*-structure (?); hypodermium forming a cutis, consisting of filiform,

*) This genus is here treated in the narrower sense i. e. without the element formerly known as *Hemimycena* (Sing.) Sing., and without the section *Xanthophylli* Sing. (see under *Gerronema*).

somewhat pigment-incrusted (but this may be due to an artefact) hyphae.

This is authentic material, W r i g h t, F. C. W. no. 100, (LPS) which agrees with the type but shows more spores. Further notes on the type see Dennis, Kew Bulletin for 1951: 389. 1951. This is apparently identical with *Collybia viridis* Rick and should be known as **Marasmiellus atroviridis** (B. & C.) Sing. c. n.

M a r a s m i u s b r a s i l i e n s i s Berk. & Mont.

Spores not found; trama nonamyloid, epicuticular hyphae diverticulate; surface of stipe formed by undulate, forked and diverticulate hairs, with numerous entire ones intermixed.

This is the type, (K), from Bahia, Brazil, with subdistant lamellae, with some lamellulae, with the stipe distinctly covered by a pruinate-tomentose layer, more glabrescent above but not quite glabrous, slightly tapering upward, now gray at base and light reddish brown above, insititious. This is undoubtedly a species of *Marasmiellus*, **M. brasiliensis** (Berk. & Mont.) Sing. comb. nov. The species described under the name *Collybia brasiliensis* by D e n n i s from Trinidad, no. 252, (K) does not seem to be the same; but it is apparently correctly determined as *Collybia*.

M a r a s m i u s c a l a m i Petch, Trans, Brit. Myc. Soc. **31**: 38. 1947.

Type material coincides well, in all visible characters, with Petch's diagnosis and with obviously identical material from Venezuela:

Pileus white or cream white (with a greenish tinge acc. to Petch), very finely pruinose when seen under a lens, sulcate, 4—10 mm broad (fresh, up to 20 mm acc. to Petch), — Lamellae white, dried yellowish, rather thick, distant, broad, often forked or with more or less venose interlamellar spaces, rounded to adnate, with lamellulae. Spore print white, appearing yellowish now on black paper. — Stipe varying from strongly eccentric to sublateral or even absent, very short and very strongly curved, where by the pileus is also attached laterally or with an eccentric point of the pileus surface. — Context white, thin.

Spores 13—18 ⇌ 4.3—5(6) µ, smooth, subulate to subulate-clavate and often slightly curved like *Fusarium*-conidia, or else cylindrical, hyaline, nonamyloid; basidia and sterile basidia (cystidia?) clavate, the latter somewhat opalescent; hyphae of the trama hyaline, nonamyloid, with clamp connections; not gelatinized; epicutis of pileus with a very distinct *Rameales*-structure of diverticulate elements at the surface; cheilocystidia filamentous to somewhat swollen at places, wavy to nodose or with side branchlets, or forked, numerous but intermixed with some basidia, 36 ⇌ 3.5—4.2 µ (if filamentous).

The type was collected on dead stems of *Calamus*, Peradynia, December 25, 1923; the South American material was collected by G. W. Martin, Hacienda Cincinnati, 1250—1500 m elev., on bark,

Sierra de Santa Marta, Dep. Magdalena, Venezuela, Aug. 18, 1935. The correct name for this characteristic species (because of the large spores) is **Marasmiellus calami** (Petch) Sing.

Collybia castaneidisca (Murr.) Murr.

Spores 8.5—9 ⇌ 3.5—3.8 μ, hyaline, smooth, cylindrical, nonamyloid; cystidia moderately numerous, ventricose or ventricose-subcapitate, hyaline; epicutis of pileus with diverticulate elements, many hyphae of cuticle with incrusting pigment. Stipe velutinous, not insititious. Lamellae almost free, close. Pileus innately radially fibrillose and rather large.

This is undoubtedly a species of *Marasmiellus* closely related with *Marasmiellus fascicularis* Rick ex Sing. from which it differs in pigmentation (incrusting pigment) and larger spores. The analysis was made from part of the type collection (IA). The new combination **Marasmiellus castaneidiscus** (Murr.) Sing. is proposed.

Marasmius gilvus Pat., Bull. Soc. Mycol. Fr. **9**: 125. 1893.

Collybia gilva (Pat.) Sing., Lilloa **22**: 201. 1949 (1951).

Spores 7(10) ⇌ 3.3(4) μ; basidia 21—28 ⇌ 7.7—9 μ, 4-spored; basidioles fusoid, 21—28 ⇌ 6 μ; tramal hyphae with slightly (0.5 μ) thickened walls at places, 2—6.5 μ thick; cuticle of pileus showing a distinct *Rameales*-structure with nodose erect bodies; cheilocystidia ramose or strongly ramose-diverticulate-forked; clamp connections numerous; both spores and hyphae are nonamyloid.

This is the paratype from Quito, Ecuador, coll. Lagerheim, February 1892, FH. I have studied the type which is in less favorable condition and I concluded that the species belongs in *Collybia,* which is an error. Recent collections caused me to revise the analysis of the type and the „cotype" and to compare them with material from Panamá:

Marasmiellus gilvus (Pat.) Sing. comb. nov.

Pileus almost fuscous bister in the center and gilvous pallid on margin, or more gilvous all over, glabrous to innately fibrillose, convex papillate in the centrally stipitate primordia, soon repand, with or without an umbo, and becoming slightly to strongly eccentric, 2—5 mm broad. — Lamellae concolorous with the margin of the pileus, with concolorous, entire edge, distant or subdistant, regularly didymous (5—9 through-lamellae), adnexed or sinuate-adnexed, more or less flocculose at edge, narrow to broad, sometimes one forking. — Stipe at first (primordia) longer, soon becoming as long or shorter than the pileus diameter and eccentric, brownish, pruinate then glabrescent, with thickened base or more rarely equal, often curved at maturity, insititious, 1—2.5 ⇌ 0.5 mm. — Context whitish.

Spores 7—8 ⇌ 3.8—4 μ, ellipsoid, nonamyloid, smooth, thin-walled, hyaline; basidia 21—28 ⇌ 7—9 μ; cystidia on sides of lamellae none; edge with strongly ramose, forked, nodose, or diverticulate

cheilocystidia; epicutis of pileus of filamentous hyphae which are forming a cutis, the uppermost ones forked, nodose, or diverticulate; hypodermium consisting of radially arranged filamentous hyphae forming a cutis, with thin walls, with fuscous incrusting pigment (an artefact?), and with pale yellowish gray dissolved intracellular pigment, with smooth wall, subparallel; all hyphae with clamp connections, those of the gill trama hyaline, filamentous, not gelatinized, nonamyloid.

On branches of a dicotyledonous tree, Martin no. 3921, (F, IA) and on small rotting branchlets, L a g e r h e i m (FH), always more or less gregarious, from Panamá to Ecuador.

D i c t y o p l o c a g u a d e l u p e n s i s Heim sensu Dennis.

Spores 7.3—9 ⇌ 4.7—5.2 μ, nonamyloid, smooth, hyaline; cystidia none; epicutis of pileus with strongly diverticulate repent hyphae and short thin nodose and wavy erect hairs, some of these hairs also diverticulate; hyphae of the trama nonamyloid, hyaline, but filled with a fuscous cell sap in the hypodermium; clamp connections present. There is an abundant white basal strigosity.

This was collected by Dennis and determined *Dictyoploca guadelupensis* with which it seems to agree in many ways. If this is actually the same species as Heim's material from Guadeloupe, it should be transferred to *Marasmiellus* (where it belongs among the species with basal strigosity).

A g a r i c u s h e m i l e u c u s Berk. & Curt.

Spores 6 ⇌ 3 μ, hyaline, smooth, nonmyloid; epicuticular hyphae appear to be smooth, but hyphae of the surface layer of the stipe are definitely diverticulate; all hyphae with clamp connections, nonamyloid. Lamellae close to crowded. Stipe apparently pruinate, pileus fuscous, paler in center.

This is the type as preserved at K. Unfortunately, the base of the stipe is clipped off and one cannot tell with certainty whether this belongs to the insititious species. A transfer is not proposed until more is known about this species. The interpretation given by Dennis would locate this fungus in *Collybia* (there is a basal fibrillosity and white arochnoid mycelium present at the base and the epicutis of the pileus seems to be made up of filamentous smooth hyphae), but I have doubts whether this is actually conspecific with the type since the lamellae are only subclose and the carpophores smaller.

M a r a s m i u s i n o d e r m a Berk., Hooker's Journ. Bot. 3: 15. 1851.

Spores (5.8)9—10.3 ⇌ (4.5)6—6.3 μ, nonamyloid, hyaline, smooth; cheilocystidia reminding one of the elements of the epicutis; epicuticular elements strongly diverticulate with erect excrescencies; hyphae all hyaline, with clamp connections, nonamyloid. The stipe is eccentric, the lamellae slightly closer than in some specimens of

M. semiustus but within the range of variability of that species, subclose to subdistant.

This, the type from Pará, Brazil (Spruce, K) is pressed flat, but recognizable enough and easy to analyze. It is undoubtedly identical with the species called *Marasmiellus semiustus* by me, and the latter name has to be replaced by the earlier one: **Marasmiellus inoderma** (Berk.) Sing. comb. nov.

Marasmius sabali Berk.

The type, from Bermuda, (Challenger Expedition, K), is in good condition. The diverticulations are very strongly developed and often remind one of dendrophyses (in the sense of the term as used in *Favolaschia,* but with relatively elongate setulae and more irregular in size and shape); diverticulate elongate hyphae also numerous, especially near the margin; cheilocystidia similar and numerous but mixed in with basidioles. Spores as in *M. semiustus* (recte: *M. inoderma*). This is a synonym of the latter.

Micromphale luteum Dennis.

Epicuticular hyphae branched and nodose to diverticulate, — a strong *Rameales*-structure; hypodermial hyphae hyaline, nonincrusted; tramal hyphae only slightly gelatinized; spores small, hyaline, nonamyloid; all hyphae hyaline, nonamyloid, with clamp connections; cystidia none. The dried material is umbilicate, myriadeous, with subdistant, adnato-decurrent lamellae and eccentric stipe which is white, mealy, and insititious.

The type, (K), is in good condition, and the analysis shows that it belongs to *Marasmiellus* as **Marasmiellus luteus** (Dennis) Sing. comb. nov.

Marasmiellus omphalodes Berk.

Spores none seen; basidia clavate, basidioles subfusoid; cystidia present, slightly projecting and somewhat opaque, on the sides of the lamellae rather numerous, clavate or clavate-apiculate (with a thin apical appendage), hyaline; hymenophoral trama made up of slightly interwoven hyphae, regular or subregular; epicutis of pileus consisting of repent filamentous hyphae, increasingly more brown from a membrana pigment toward the trama (hypodermium), but no distinct pigment incrustation observed; the outermost layer with distinctly diverticulate hyphae of the *Rameales*-type: hyphae nonamyloid, with clamp connections. The pileus is described as white with umber center (Spruce) and is now slightly convex with somewhat depressed center. Lamellae close, adnato-decurrent. Stipe more or less velvety, equal, rather long, probably insititious.

This is Spruce 131 from „Panuré", the type (K). It belongs in *Marasmiellus,* and should be known as **Marasmiellus omphalodes** (Berk.) Sing. comb. nov.

„Panuré" is one of the classical collecting places of early Berkeleyan material. S p r u c e spent some time there. It is not to be found in any modern map. Therefore, it may perhaps be of interest that the correct name of the place is Ipanuré, now known as São Jeronimo, a small town on the Rio Negro.

M a r a s m i u s p a s p a l i Petch, Trans. Brit. Myc. Soc. **31**: 35. 1947.

The epicutis shows a strong *Rameales*-structure, consisting of irregularly branched diverticulate elements which are partly melleous brownish, partly hyaline; hyphae nonamyloid, with clamp connections. P e t c h's description is correct, and his figure corresponds well with the specimens (pl. III, fig. 11, l. c.). Identical material was collected by D e n n i s (no. 132) from Trinidad. Both the Ceylon type and the neotropical collection are preserved at K and were compared.

This species belongs in *Marasmiellus,* and should be known as **Marasmiellus paspali** (Petch) Sing. comb. nov.

M a r a s m i u s r u b e l l u s Mont., Ann. Sc. Nat. ser. 4, **1**: 115. 1854.

While there are only a few fragments at PC, I had the opportunity to study good type material at FH.

Spores few, 5.2 ⇌ 2.8 μ, hyaline smooth, ellipsoid, nonamyloid; surface layer of both pileus and stipe with distinct *Rameales*-structure, on stipe with thickwalled elements; hyphae nonamyloid. The carpophores are attached to leaves, insititious, have the size of *Naucoria centunculus,* the pileus now being cinnamon tan.

This is L e p r i e u r no. 993. There is another collection, apparently compared with this type by Patouillard, collected by Duss (48 = 49) on *Sloanea caribaea* leaf from Bois des Bains Jaunes, Guadeloupe, (FH) which differs from the type only in more velutinous stipe, especially when seen under a binocular, but the coating is on very dark ground exactly as in the type, and, since all other characters coincide, I think it is the same thing. Here, there are many more spores on the lamellae where the following measurements were obtained: 5.2—5.5 ⇌ 3—3.3 μ.

The species belongs without any doubt in *Marasmiellus,* sect. *Rameales.* It is herewith transferred to that genus as **Marasmiellus rubellus** (Mont.) Sing. comb. nov.

Heliomyces sprucei Berk.

Spores approximately 6—7 ⇌ 3 μ, cylindrical, smooth, nonamyloid; cystidia none; epicuticular layer of the pileus consisting of a very weak *Rameales*-structure, with intermittently nodose hyphae and occasional ramifications, the pigment (where present) localized in the hyphal walls but not distinctly incrusting the wall on the outside; tramal hyphae nonamyloid, with clamp connections, only very slightly gelatinized, irregularly arranged in the context, apparently with airspaces rather than imbedded in a gelatinous mass because visibly looser than in the cuticular layer. Stipe slightly fibrillose below,

otherwise glabrous, insititious. Lamellae decurrent, distant, not interveined. Pileus strongly sulcate and pallid, deep badious between striae. On small branches.

This is the type (K) from Brazil, Spruce 91. What I think is the same species, was collected and described by Dennis from Trinidad as *Micromphale subavellaneum,* and possibly by Singer & Digilio as *Marasmiellus griseolobrunneolus.* The differences between these three species are so small that it is quite possible that they are all synonyms. The only striking character by which it may be possible to distinguish *M. sprucei* is the radially striped pileus which, in its color distribution reminds one of *Marasmius tageticolor* Berk. Since in the case of the latter species this character was found to be constant in one case, and inconstant in another similar species (*M. haematocephalus* Fr.), it remains to be seen whether it is constant in *M. sprucei.* For the latter, the new combination **Marasmiellus sprucei** (Berk.) Sing. is proposed.

Marasmius subcoracinus Berk. & Curt.

Spores 5.5—6.3 ⇌ 2.5—3.3 μ, hyaline, smooth, guttiform-elongate to ellipsoid-oblong; basidia 16.5 ⇌ 3.8 μ, 4-spored; cystidia none; elements of the epicutis of the pileus interwoven, with strong diverticulation; hypodermial layer consisting of smooth to silghtly diverticulate hyphae, interwoven but forming a cutis, with melleous walls, but not incrusted by pigment; surface layer of pileus consisting of rather thick-walled, erect to ascendant, somewhat pilose, thick hyphae and occasional somewhat smaller thin-walled hyphae, all obtuse above and some wavy-nodulose-irregular, others regular and entire; trama of the pileus consisting of loosely arranged hyphae which are thin and hyaline, possibly somewhat gelatinized; trama of the lamellae as above; trama of the stipe consisting of multiseptate, thick-walled, parallel hyphae. The carpophores look somewhat like *Marasmiellus ramealis*: they have adnate distant lamellae and insititious stipe.

This is the type, Wright no. 22, from Cuba (FH) on fallen branches. It must be transferred to *Marasmiellus* as **Marasmiellus subcoracinus** (Berk. & Curt.) Sing. comb. nov.

Collybia subfumosa Speg., Bol. Acad. Nac. Cienc. Córdoba **11**: 390. 1889.

See my Type Studies IV, Lilloa **23**: 167. 1950 and Type Studies VI, Lilloa **26**: 130. 1953 where a description of Brazilian collections is given. This species is also common in Florida (where it was collected by Murrill under the name *Cvllybia subluxurians* and by the author as *Collybia* spec. and **Marasmiellus subfumosus** (Speg.) Sing. comb. nov. The latter binomial is the correct one). I add a full description of the Florida material:

Pileus „russet“ (Ridgway), then „Mikado brown“ to „cinnamon“ or with „Verona brown“ striae (all R.) on paler ground, with medium to long-striate margin, but almost smooth when mature, varying in some specimens to deeply folded-sulcate, hygrophanous, radially innately fibrillose at least in age or even breaking into lacerate fibrils when old, campanulate-convex to convex-umbilicate when young, then subumbonate to more rarely umbonate and usually umbilicate, eventually flattened, rarely concave, fleshy, 26—60 mm broad. — Lamellae avellaneous-white, soon brownish white or pale brownish, crowded to close, 2.5—3.5 mm broad, i. e. narrow, arcuate, adnate to subdecurrent, eventually often separating from the apex of the stipe; spore print whitish, just off A (Crawshay) not reaching B, and not showing any flesh tinge. — Stipe concolorous with the pileus but covered with a whitish fibrillosity or pruina which may cover the stipe so completely that the latter appears whitish all over, but usually soon at least with „fawn color“ to „Mikado brown“ (R.) spots, especially near the base where the ground color is deeper, often canaliculate, often somewhat bulbous at base, the apex somewhat grooved in some carpophores, stuffed, later hollow, equal above the bulb (where it exists), the latter sometimes more or less acuminate below, 26—65(130) ⇌ 1.5—4(10) mm (bulb to 9—10 mm in diam.); basal mycelium fibrillose. — Context white to whitish, with an odor of HCN (*Marasmius oreades*), often mixed with a rancid disagreeable smell (but *not* of sauerkraut, i. e. *Micromphale foetidum*).

Spores 5.2—7.8 ⇌ 3—4.7 μ, mostly 5.5—7 ⇌ 3.7—4.2 μ, hyaline, guttiform to ellipsoid, nonamyloid; basidia 21—26 ⇌ (4.3)5—5.8 μ, 4-spored; cystidia none; cheilocystidia clavate, hyaline, very numerous, empty, obtuse, not conspicuous, 20—36 ⇌ 6.8—12 μ; many with irregular excrescencies; epicutis of the pileus fragmentary, i. e. interrupted, but in places well developed and formed by hyphal outgrowths which are ascendant to erect and strongly nodose or with short excrescencies, hyaline, 12—27 ⇌ 4.3—6 μ; hypodermium brownish melleous and sparingly diverticulate where exposed, at places with distinct hyaline to melleous incrustations, consisting of mostly narrow (1—15 μ) hyphae forming a cutis; velvet of the stipe surface formed by a tomentum of ascendant hyphae which are distantly to densely diverticulate and sometimes forked, fragile, stramineous, thin-walled, interwoven; all hyphae with clamp connections and nonamyloid.

On heaps of dead leaves or dead grass in and outside the wooded areas (leaves of *Myrica,* Gramineae, *Persea*), often along the margin of the forest and in plantations, usually very gregarious to cespitose or at least in small crowded groups, fruiting in August, September and October, Alachua Co. south to Dade Co., Murrill (Gainesville, Aug. 18, FLAS), R. S i n g e r (Highlands Hammock State Park, F 504;

Miami F 1286; Homestead, F 850, all F). Another collection from Massachusetts (R. Singer, Wakefield, sub *Collybia* aff. *subluxurians* and cf. *hygrophoroides*, FH), may be this same species. Its wide distribution makes it possible that it has been described by other authors before Spegazzini, but we are not aware of such a fact. After Spegazzini it was probably described by Murrill at several occasions.

Marasmius subingratus Dennis.

Spores 8 ⇌ 3.8 µ, hyaline, smooth, nonamyloid; epicutis somewhat fragmentary and very thin, consisting of ascendant to erect hyphal outgrowths which are hyaline, clavate to filamentous or ampullaceous, small, often with secondary excrescencie or forked; hypodermium intermixed, consisting of repent hyphae of very variable diameter with a strong fuliginous pigment incrustation, many of these locally swollen to form short inflated cells, more or less interwoven; underneath the hypodermium, the tramal hyphae subhyaline and nonamyloid; hairs of the stipe extremely versiform as the elements of the epicutis of the pileus, even sometimes vesiculose or subulate and at times with clamp-less septa bicellular, 27—66 ⇌ ± 7.3 µ; hyphae otherwise with clamp connections. The carpophores are very small with relatively long stipes, the latter insititious on sticks, whitish at base, middle now umber gray, apex whitish.

This is the type from Trinidad (K) which I consider as a species of *Marasmiellus,* **M. subingratus** (Dennis) Sing. comb. nov.

Agaricus synodicus Kunze in Fries;
Marasmius nivosus Berk.;
Marasmius epileucus Berk.;
Marasmius subsynodicus Murr.

All four are identical in my opinion. Dennis studied the type of the first of the four species, and comparing his notes with notes taken at K on the two Berkeley species (Spruce types from „Panuré" and Mt. Cocui, Brazil) by the author, one may certainly agree that this is a not uncommon species of the neotropics, distributed from Florida to Brazil, and characteristic because of the white-bleaching small pileus, the distant decurrent lamellae, the completely white (dried) insititious stipe, and the rather small spores. The Florida material (Murrill as *M. subsynodicus* and Singer F 802, F) seems to be identical in all important characters, and so is material received from the Panama Canal Zone. This material is redescribed below:

Pileus pale isabella color to cinnamon, bleaching white or whitish when drying or dried, finely pulverulent-subtomentose when seen under binocular, with smooth to somewhat radiately grooved entire margin, hemispherical-convex, then expanding to convex and flat, more often obtuse than umbonate, 2—12 mm. broad. — Lamellae white, tending to become cream color or subconcolorous when dry or

dried, intermixed with lamellulae or forked ones, subdistant to mostly distant, narrow to moderately broad, adnato-decurrent, adnate with a decurrent tooth, or plainly decurrent, sometimes separating incompletely from the apex of the stipe and then seemingle subcollariate in age. — Stipe concolorous with pileus but always completely white including the base in dry or dried condition, finely pubescent above and almost pilose below when seen under a binocular, glabrescent above and pubescent below when old, equal or tapering downward, smooth, insititious, 4—5 ⇌ ½—1½ mm. Context very thin, somewhat tough and dry, inodorous.

Spores 5—8.2 ⇌ 2.5—3.5 μ, subcylindrical to tear shaped, hyaline, smooth, nonamyloid; basidia 19.5 ⇌ 5.5—6.5 μ, 4-spored; cystidia none; cheilocystidia filamentous and mostly wavy, many somewhat nodose or with bifurcate apex, others entire, covering a wide zone from the edge inward, more rarely scarce at the very edge; hyphae of the trama underneath the disc often thick-walled, all non-amyloid and with clamp connections; epicutis of pileus of interlaced to somewhat interwoven hyphal elements of somewhat irregular shape, but only with scattered nodules, forks, or semiglobose diverticules not showing a strongly developed *Rameales*-structure except in some places in old specimens; there is some melleous incrusting pigment in some sections; surface layer of stipe consisting of mostly filamentous elements, not more diverticulate than those of the epicutis of the pileus. On living (green) and dead leaf petioles (dicots) and more often on dead sticks of vines and dicotyledoneous herbs in tropical forest. I have seen material from Florida (type of *M. subsynodicus* Murr., also my F 802 from Matheson Hammock, Dade Co., Flo.), and G. W. Martin & A. L. Welden, from the Panamá Canal Zone, both (F), an Theissen's material of *Marasmius petalinus* Berk. & Curt. sensu Theissen, from São Leopoldo, Rio Grande do Sul, Brazil, Rick Fungi Austroamericani no. 208, FH. This, however, is not identical with the type of *Marasmius petalinus* Berk. & Curt. (FH) from the Bonin Islands.

The Brazilian material has slightly better developed *Rameales*-structure on pileus and stipe than both the types enumerated above and the Florida material, but I think it is still identical and, as the other collections, most closely related to *Marasmiellus dealbatus* (Berk. & Curt.) Sing., see below. It should be known as **Marasmiellus synodicus** (Kunze in Fries) Sing. comb. nov.

Marasmius petalinus Berk. & Curt.

See under the species treated in the preceding paragraphs.

Marasmius dealbatus Berk. & Curt.;

Marasmius subgraminis Murr., Bull. Torr. Bot. Cl. **67**: 151, fig. 1, 1940.

The type of the former (FH) as well as of the latter (FLAS) has spores 5.3—7.5 ⇌ 2.7—3.7 μ and a poorly developed *Rameales*-structure on both pileus and stipe, the latter more often completely white than with brownish gilvous to pale gilvous base, always growing on Gramineae, with the spores as well as the hyphae nonamyloid and numerous clamp connections. This is a characteristic species which is most closely related to *Marasmiellus synodicus* (see above) but can be distinguished easily by the habitat. The new combination **Marasmiellus dealbatus** (Berk. & Curt.) Sing. is here proposed.

Additional material from Florida (F 143, F 140, F, FH) and from Barro Colorado Island, Panamá Canal Zone, G. W. Martin & Welden no. 7092 (IA, det. Singer) has also been studied. A detailed description appears unnecessary since the species has been well described by Dennis (Trans. Brit. Myc. Soc. **34**: 445. 1951) from Trinidad.

Marasmius epochnous Berk. & Br.

Spores 7.5—9 ⇌ 3.3—3.8 μ, hyaline, smooth, nonamyloid; epicutis with *Rameales*-structure; trama nonamyloid, with numerous clamp connections.

This it the type (K), growing on dicot branchlets. It is obviously a *Marasmiellus* with white pileus and eccentric stipe, almost lateral in most cases. I have studied material from Florida and from the Panamá Canal Zone which evidently belongs here. A revised description follows:

Pileus white, slightly pruinose-tomentosulous, orbicular or suborbicular, convex, smooth or almost smooth, 3—5 mm. broad. — Lamellae white, distant, more rarely subdistant, free, adnexed, or adnate, intermixed with lamellulae, often interveined, but also often with smooth intersticia, if interveined only with a few very low anastomoses; spore print pure white. — Stipe white to brownish white, tomentose to furfuraceous-fibrillose, always present but usually short and curved, 0.5—2 ⇌ 0.1—0.2 mm., often arising from a patch of white radiating hyphal fibrils appressed to the substratum, very eccentric to lateral. Context very thin, white, inodorous.

Spores 5.8—9 ⇌ 3.2—4 μ, mostly 6.7—7.3 ⇌ 3.3—3.7 μ, smooth, nonamyloid, hyaline; basidia 4-spored; cystidia none; cheilocystidia cauliflower-like, nodosus-branching with short excrescencies, especially at the apex which is often somewhat swollen, hyaline, making the edge heteromorphous; epicutis of pileus a thin layer with *Rameales*-structure, consisting of diverticulate elements, well developed although slightly less strongly and deeply developed than in *M. inodermus;* same structure on the surface of the stipe; all hyphae nonamyloid with clamp connections.

On dead branches, very gregarious, Florida (Thaxter, Dade Co., F); Panamá Canal Zone (Martin & Welden 7363, Barro

Colorado Isl. F); Brazil (Schiffner no. 22, State of São Paulo, FH, as *Marasmius schiffneri*); Ceylon (type, K).

Marasmius schiffneri Bres. in Hoehnel, Denkschr. Akad. Wiss. Wien **83**: 15 (reprint pagination). 1907, is described as having spores 9—11 ⇌ 6—8 μ. I am therefore not fully certain that the material from the Patouillard Herbarium (FH) is part of the type, or if so, identical with the holotype studied by Bresadola. If Bresadola's spore measurements were erroneous, *M. schiffneri* would become another synonym of *M. epochnous*. The latter must be transferred to *Marasmiellus* as **Marasmiellus epochnous** (B. & Br.) Sing. comb. nov. It is closely related to *Marasmiellus concolor* and *M. gilvus*.

Marasmius concolor Berk. & Curt.

Spores 5.5—6.5 ⇌ 2.5 μ, oblong, smooth, hyaline, nonamyloid; epicutis consisting of strongly diverticulate elements forming a typical *Rameales*-structure; hyphae of the trama nonamyloid. This is a typically astipitate species; the color of the pileus may have been white, the color of the lamellae most probably was. On dicotyledonous branch.

This is the type, Wright no. 74 (FH). It is undoubtedly a *Marasmiellus*, related to *M. epochnous*, but without stipe, and possibly differing in color. The combination **Marasmiellus concolor** (B. & C.) Sing. comb. nov. is proposed.

Singer & Digilio described a species, called "*Marasmius concolor* Berk.(?)" (Lilloa **25**: 190. 1951) from Misiones, Argentina. This species agrees well with Berkeley's description, but the type analysis, as given above, proves that our doubts regarding its identity were justified. The Argentine species is a true *Marasmius*, and the new name **Marasmius neosessilis** Sing. nom. nov. is proposed for that species: Pileo carneo, sessili; lamellis albis, distantibus; stipite nullo; sporis 9.5—10 ⇌ 4—4.8 μ, cystidiis nullis; epicute subcellulari ea elementis granulosis vel diverticulatis formata; hyphis amyloideis, fibulatis. Ad ramos. Cataratas del Iguazú, Misiones, Argentina, Singer & Digilio M 57, LIL.

Micromphale S. F. Gray.

Collybia pilosa Dennis.

Spores 9.7—11.7 ⇌ 5.8 μ, with finely granular contents, hyaline, nonamyloid, smooth; epicutis of the pileus consisting of depressed or ascendant fascicles of subcylindrical to long-clavate hyphal ends with rounded apex; hypodermium — a cutis consisting of repent elongate hyphae with brown intracellular pigment (not incrusted); beneath are the hyaline hyphae of the trama which are non-gelatinized, nonamyloid (or perhaps very slightly amyloid?); hymenophoral trama regular; all hyphae with clamp connections; cystidia in hymenium none. The fruiting bodies have somewhat the habit

of *Micromphale foetidum,* but are not gelatinous, with the interstitia of the lamellae distinctly interveined, and the base of stipe distinctly insititious.

This species (type, K, Dennis 315 A from Trinidad) is somewhat difficult to place. It seems somewhat ambiguous between *Marasmiellus* and *Micromphale,* and may be related to *M. perforans.*

Agaricus euomphalus Berk., Hooker's J. Bot. **8**: 131. 1856.

Spores none found; cystidia none; cuticle of the pileus formed by filamentous repent hyphae with some olive-umber resinaceous pigment incrustations (scattered), with some rare and occasinonal diverticulations and some slight roughness noticeable in the walls, but no *Rameales*-structure present; hyphae of the trama hyaline, some thin-, most thick-walled, slightly gelatinized, centripetally and radially arranged, subirregular-subparallel in the pileus, in the lower portion of the gill trama more axillarly arranged and subparallel, hyaline and more thin-walled, also slightly gelatinized, with clamp connections, nonamyloid. The carpophores have somewhat the habit of a *Gerronema elasticum* but the stipe is distinctly insititious, and the hyphae are subgelatinous; in addition, there is incrusting pigment in the pileus cuticle. The pileus is said to be cinereous-white, the lamellae whitish (collector's note on fresh material).

With the data at hand, the type material (Spruce 122, 133, both identical with each other, from Brazil, K) seems to belong to a representative of the genus *Micromphale,* and the combination **Micromphale euomphalum** (Berk.) Sing. comb. nov. is proposed herewith. Whether or not Dennis's material from Trinidad (with slightly yellowish lamellae and more deeply colored pileus), slightly more subdistant (than medium close) lamellae, and spores 6.5 ⇌ 4 μ (smooth, nonamyloid) is identical cannot be stated with absolute certainty. I have studied Dennis no. 80 from St. Joseph, on the ground under bamboo (K), and it seems to agree in all essential characters visible on the dried material although some other specimens under the same name with more distinctly radially fibrillose pileus may not be the same species. *M. euomphalum* is probably closely related to *M. foetidum.*

Marasmius stenophyllus Mont., Ann. Sc. Nat., Bot. ser. 4, **1**: 116. 1854.

Spores 4.8—6 ⇌ 1.7—2.2 μ, hyaline, nonamyloid ellipsoid-oblong or subcylindrical and sometimes curved; basidioles fusoid; cystidia and cheilocystidia none; trama at least partly somewhat gelatinized; cuticle formed by denser hyphae, a cutis, without divericulate elements, hyaline; hymenophoral trama regular, its hyphae somewhat winding; clamp connections present; no amyloid elements.

This is the portion of the type preserved at FH, and evidently in better condition than the PC collection. It consists of two collections

Leprieur no. 1027 and Leprieur 1029, one much whiter than the other, but identical with each other and obviously also with the Paris type no. 1902 cited by Dennis. This is at least a para-type. According to its characters it should be listed as **Micromphale stenophyllum** (Mont.) Sing. comb. nov.

Marasmius Fr.

The genus will be treated in a separate paper.

Hydropus (Kühner) Sing.

Collybia erinensis Dennis.

Spores strongly amyloid, 6.7—9 ⇌ 5—5.5 μ, smooth, hyaline; epicutis consisting of fragmentary islands or individually scattered but numerous ampullaceous erect dermatocystidia which are hyaline; hypodermium consisting of repent hyphae, brown, forming a cutis; tramal hyphae rather large, nonamyloid, hyaline.

This is the type from Trinidad (K), obviously a **Hydropus, H. erinensis** (Dennis) Sing. comb. nov.

Collybia cavipes Pat. & Gaill., Bull. Soc. Myc. Fr. **4**: 14. 1888, sensu Dennis (1951).

Spores 5.3—6.7 ⇌ 4.5 μ, smooth, strongly amyloid, hyaline; cystidia ampullaceous, on sides of lamellae not rare, some obtuse, few acute, about 72 ⇌16 μ; dermatocystidia on pileus undoubtedly present, but now mostly collapsed; trama of the lamellae consisting of voluminous hyphae, subregular; all hyphae nonamyloid.

This is close to *Hydropus*, and *Porpoloma*, a transfer is not proposed at present since the Patouillard type has not been analyzed.

Mycena (Pers. ex Fr.) S. F. Gray.

Corrugaria alba Dennis, Kew Bull. for 1952: 497. 1952.

Spores 7.5 ⇌ 5.2 μ, amyloid, smooth, hyaline; hymenophoral trama regular; hyphae of pileus weakly and slowly but undoubtedly amyloid; hyphae of gill trama very broad; clamp connections present.

The type from Venezuela (K) seems to be close to *Corrugaria viridiflava* Métrod, Prodr. Fl. myc. Madagasc. **3**: 127. 1949. It would therefore appear that *Corrugaria* Métrod, l. c. is most probably a synonym of *Mycena*. Certainly, *C. alba* Dennis, does not deserve to be separated from *Mycena*, and should be known as **Mycena dennisii** Sing. nom. nov. since the binomial *Mycena alba* is already preoccupied by a different species (*Hemimycena alba* (Bres.) Sing. = *Mycena* alba (Bres.) Kühner = *Omphalia alba* Bres.).

Corrugaria radiata Dennis, l. c.

Spores (6.5) 9 (10) ⇌ (3.3) 3.5 (3.7) μ, cylindrical, hyaline, strongly amyloid, smooth; cystidia none; epicutis formed of hyphal pegs and individual hairs which are very long and now appressed, filamentous, but at the very base somewhat swollen (to 8.2 μ), thin-

walled, nonamyloid; hyphae of the trama mostly thin, hyaline, long-filamentous, not clamped of the septa, very slightly amyloid.

This may be classed temporarily as a *Mycena,* but it seems to be congeneric with *Mycena lenta* R. Maire which is the type of a tentatively proposed genus, *Leucoinocybe* Sing. ad int. Since both *Corrugaria radiata* Dennis and *Mycena lenta* R. Maire are not as fully known in all aspects as would seem desirable for the publiction of a valid new genus, I refrain, at this moment, from any validation of *Leucoinocybe,* or from any transfer of the species concerned.

Laschia viridula Berk. & Cooke.;
Poromycena viridula (Berk. ex Cooke) Sing.

In view of the observations mentioned by the author in Mycologia **45**: 886, note 6, 1953, the species is herewith transferred to *Mycena* as **Mycena viridula** (Berk. ex Cooke) Sing. comb. nov.

Collybia violaceella Speg., Biol. Acad. Nac. Cienc. Córdoba **11**: 393. 1889.

For the same reasons (see above), this species is transferred to Mycena as **Mycena violaceella** (Speg.) Sing. comb. nov. — Equally, the amyloid-spored species of the "genus" *Dictyoploca* must be considered as belonging in *Mycena.* They are not different from, and should be treated with *Mycena.* It may be added that, since the lecto-holo-type of *Marasmius plectophyllus* Mont. has nonamyloid hyphae, the species determined by some authors as *Marasmius plectophyllus* with either amyloid trama or spores should be renamed and separated from *Collybia plectophylla.*

Baeospora Sing.

Collybia pleurotoides Dennis.

Spores about 4.5 ⇌ 3.7 μ, smooth, distinctly amyloid, hyaline; cystidia none seen; crystalloid bodies, somewhat larger than spores floating all over the preparation; dermatocystidia e. gr. 24.8 ⇌ 7.3 μ but rather variable, cylindrical with often geniculate base, mostly erect on a cutis of hypodermial, colored, repent hyphae, the latter, where exposed, showing isolated cylindrical diverticules (rare) which may be considered as transitions toward dermatocystidia, hyphal diameter e. gr. 13 μ, walls nonamyloid.

This is the type, Dennis no. 247 (K), consisting of two carpophores on what night be a herbaceous stick. The species belongs apparently in *Baeospora.*

Heimiomyces Sing.

Agaricus hilarianus Mont.;
Agaricus melinosarcus Kalchbr.;
Agaricus rheicolor Berk.;
Agaricus cayennensis Mont.

The four types (*Agaricus hilarianus* — PC; *A. melinosarcus* and *rheicolor* — K; *A. cayennensis* — FH) are identical with *Heimiomyces tenuipes* (Schwein.) Sing. Compare also Type Studies on Basidomycetes II, Mycologia **35**: 158. 1943 (on authentic material of *Marasmius rhabarbarinus* Berk.*) and *Marasmius amabilipes* Peck) and id. IV, Lilloa **23**: 201. 1950 (1952) (on *Agaricus aurantiellus* Speg.).

Crinipellis Pat.

Crinipellis rubida Pat. & Heim.

The type from Venezuela (PC) is macroscopically correctly described as far as can be judged from the dried material. The spores are, however, not as described; they are very rare in the hymenium, and those indicated by Heim must have been immature. Mature spores are very numerous among the hairs of the pileus and stipe; they are exactly like those of *Crinipellis mirabilis* Sing., viz. sclerotizing in the main portion where they become thick-walled and opaque while a small cell at the apex and at the base, or only at one of the ends, becomes separated by a septum, and the small distal cell remains thin-walled, collapsing in the end, and leaving a cylindrical to subangular non-transparent spore in the overmature stage. Neither the immature nor the mature or overmature spores are pseudoamyloid: Basidia 4-spored, clavate; basidioles fusoid, or fusoid-apiculate from a central apical sterigmatoid thin mucro. Hyphae non-amyloid: cystidia none. Heirs of the marginal zone of the pileus hyaline to light wine red in NH_4OH, 6.5—7 μ broad, with thick (2.7 μ) wall, smooth, slightly tapering to the obtusely rounded tip, strongly pseudoamyloid, not septate, running in strands of long parallel hairs, strands radially arranged.

The dried pileus reacts with KOH to make the surface deep green, then grayish green, but NH_4OH merely deepens the wine red color of the dried cap.

C. rubidus sensu Dennis is obviously a different species.

The characters of the spores and the chemical characters show that the type is apparently closer to *C. mirabilis* than to the other representatives of the subsection *Iopodinae* Sing. However, a similar chemical color reaction is taking place in *C. eggersii* Pat., and it is quite possible that the subsection *Grisentinae* should be reunited with subsection *Iopodinae*, since the chemical differences between both sections are reduced to the difference in the NH_4OH reaction, and the septate spores do not seem to be a monopoly of subsection *Grisen-*

*) The authentic material of this species in the Curtis herbarium as well as that in the Paris herbarium are clearly this species; no claim of an analysis of the type from Brazil had been made. The latter is obviously a good *Marasmius*.

tinae, exactly as they are not found in all species of the section *Globulares* of *Marasmius*. It would be interesting to find out whether *M. mirabilis* has more vividly colored pigmentation in fresh material.

Agaricus urbicus Mont., Ann. Sc. Nat. Bot. ser. 4, **1**: 94. 1854.

Spores not found; epicuticular hairs distinctly pseudoamyloid, thick-walled, non-septate, with rounded apex; cheilocystidia present but not clearly seen; hyphae of trama hyaline, nonamyloid, with clamp connections.

This is undoubtedly a *Crinipellis*. The transfer to *Crinipellis* has already been made by Dennis who indicates the spores as 10—11 ⇌ 4—5 μ "with a larger granular body in the center". My material came from the type, Leprieur 989, (PC). A correct determination of this species cannot be undertaken without more data on spores and cheilocystidia. The habitat suggests *C. subtomentosa* (Peck) Sing. which Dennis thinks "very probobly the same". However, if the spore measurements cited above are correct, the spores wolud be too narrow for that species. It might be possible to gather topotypical material from "sandy soil in Cayenne" (the specific epithet was given because of its occurence in the city of Cayenne, French Guyana).

Marasmius pseudoarachnoides Dennis.

This is a very remarkable species. Spores 18—19 ⇌ 4 μ, sec. Dennis (from spore print), almost clavate, hyaline. The surface of the pileus is formed by the rounded hyphal ends which have very much the structure and shape of the hypotrichial hyphae of *Crinipellis* (actually a special type of a hypodermium), some branching, somewhat irregular. Instead of the *Crinipellis*-hairs, these hyphal ends bear a small (diam. about 3 μ) pseudoamyloid disc inserted on nonamyloid wall material; from this disc, a number (3—10) of flagella-like appendages emerge which are likewise strongly pseudoamyloid, flexible and tapering into a needle sharp tip, 0.3 μ thick at the base and 1.7—4.8 μ long; seen from above, this structure looks as if superimposed upon a cellular structure (optical section of the hyphal ends of the hypotrichium); hyphae of the trama nonamyloid, with clamp connections. The pileus has a central short stipe which at its base connects with white rhizomorphs. The surface of rhizomorphs and stipes has the same structure as indicated above. The lamellae are very distant.

This it the type from Trinidad, coll. Dennis (K). Since there are other species of *Crinipellis* with white rhizomorphs *), it must be assumed that — all other characters agreeing — the species is a

*) **Crinipellis sarmentosus** (Berk.) Sing. comb. nov. (*Marasmius sarmentosus* Berk. from Jamaica); **Crinipellis actinophorus** (Berk. & Br.) Sing. comb. nov. (*Marasmius actinophorus* Berk. & Br., from Ceylon) and probably also *Marasmius tomentellus* Berk. & C. and *M. rigidichorda* Petch.

Crinipellis in which the "flagellae" are homologous with *Crinipellis*-hairs. This species deserves to be separated in a new section which I propose to call *Pseudoarachnoidei,* characterized by the flagella-like structures described above *).

Chaetocalathus Sing.

Agaricus columellifer Berk., Hooker's J. Bot. & Kew Misc. **4**: 161. 1952.

Spores 7.5 ⇌ 5.5 μ, ellipsoid, hyaline, few; hairs of pileus strongly pseudoamyloid, hyaline in NH_4OH, 3—4 μ thick, curly in places, once one seen with a side branch, inner wall strongly pseudoamyloid and outcropping, where hairs are broken, as a red-brown cap. Carpophores white, with a strong columelliform stipe which is not attached to the substratum; hairs at edges of lamellae ("cheilocystidia") forked or branched, pseudoamyloid, occupying a broad sterile band.

This is the type which was also studied by Pilát who transferred it to *Marasmius* (Transactions Brit. Myc. Soc. **33**: 219. 1950). It was collected in Borneo (K), but was luckily re-collected by Martin & Welden so that we are in a position to give a complete description under the correct name: **Chaetocalathus columellifer** (Berk.) Sing. comb. nov.

Pileus white to yellowish white, strongly radially pilose-woolly with somewhat crenulate-fimbriate margin, dry, often with projecting margin, attached with some part of the surface of the pileus and cup-shaped, 1—8 mm. broad. — Lamellae in dried material buffish white to umber, radiating from the reduced stipe, with 1—2 lamellulae intermixed between each pair of through-lamellae, medium broad, subdistant to distant, adnexed to adnate to the stipe; spore print pure white. — Stipe rudimentary and functionless (with base not attached to substratum), columelliform or conical, conspicuous, white, tomentose; a pseudostipe is sometimes present (extracted portion of the pileus where attached to the substratum), but short and inconspicuous. — Context very thin, practically absent.

Spores (7.5) 8—10.2 (10.5) ⇌ 5—6.8 (7.2) μ (from print), thin-walled, after discharge, when caught in the hairs becoming thick-walled and quite frequently also septate, all pseudoamyloid when mature, hyaline in NH_4OH, ellipsoid, smooth; basidia 4-spored; hairs ("cheilocystidia") forming a broad belt along the edge of the lamellae occupying up to one third of their bredth, spinose and simple, or (most of them) spinose-forked, doubly forked or repeatedly forked, very acute, about 35 μ long or longer, hyaline, strongly pseudoamyloid.

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*) *Crinipellis* sect. **Pseudoarachnoidei** Sing. sect. nov. Hyphis terminalibus hypotrichii disco flagellisque pseudoamyloideis obsitis. Typus: **Crinipellis pseudoarachnoides** (Dennis) Sing. c. n. (*Marasmius pseudoarachnoides* Dennis).

showing divisions in the lower, middle, or upper portion into (0) 2 to 5, rarely more, spinules and sometimes rather broad underneath the branchings (up to 7.5 μ), otherwise broadest below (3.5—5.5 μ), above around 2—4 μ broad and sometimes the base deep-rooting in the trama (and then to 100 μ and more long) with thick (1.5—1.7 μ) walls; the same hairs sometimes appearing scattered on the sides of the lamellae beyond the marginal zone as "pleurocystidia"; hairs of the pileus usually all simple, dense, hyaline, sometimes slightly incrusted, strongly pseudoamyloid, with mostly acute ends, 3—4 μ thick, some curly, sometimes some with side-branches; hymenophoral trama with some inflated hyphae intermixed in the generally filamentous tissue, hyaline, nonamyloid.

On bark and palm leaves, gregarious, fruiting from June to August (in the western hemisphere), known from Borneo (type) and Panamá Canal Zone, Martin & Welden no. 7279, no. 8562, no. 8580, no. 8682, from Barro Colorado Island (F, and IA).

This species is related to *Chaetocalathus bicolor*.

Trogia hispida Mass., Kew Bull. f. 1901: 162. 1901.

The type from Aburi, Gold Coast, (K) was studied first by Dr. Dennis who discovered the strange structure of the carpophores. The woolly covering consists of pseudoamyloid thin hairs rising from a hypotrichium separating it from the trama proper; the latter pervaded by numerous ochraceous setose hyphae running vertically from the hypotrichium to the hymenophore and many entering the hymenium as cystidia which are often forked at the apex; hymenophoral hyphae regular, interwoven, flanked by a broad irregular subhymenium, cheilocystidia very dense, stramineous-ochraceous forked with acute tips, occupying a broad zone, very interwoven, these as well as setose hyphae and ycstidia pseudoamyloid, the cheilocystidia most strongly so; hyphae hyaline, with clamp connections, nonamyloid. Pileus white more brownish at margin where woolly layer is thinner, brown at level of hypodermium, pale brown in trama and lamellae which are crowded, adnexed to a white horizontal tomentose lateral stipe, but pileus also directly attached to a basal brownish socle (like true Trogias), lateral, now 3.5 mm. broad. Spores not pseudoamyloid, about 6.5 ⇌ 5.2—5.5 μ.

This belongs in the same stirps as *Chaetocalathus africanus* (Pat.) Sing. The tramal structure is analogous to Corner's "dimitic *Pterula*-series".

Amanitaceae.

Amanita Pers. ex S. F. Gray.

Agaricus monticulosus Berk. & Curt.

The original description was apparently made up from various collections. The Kew type shows nonamyloid spores and the re-

spective carpophores seem to belong in the *muscaria-cothurnata*-group rather than in the synonymy of *Amanita cookeriana*. My interpretation (1951) is therefore not tenable although it coincides more or less with the earlier type studies by Atkinson and the original description which, however, is rather vague as far as the color and marginal striation is concerned.

Metraria Cooke & Mass.

Metraria insignis Cooke & Mass., in Sacc. **9**: 82. 1891.

Spores from print 8—10.3 ⇌ 5.8—7 μ, ovoid, nonamyloid, not metachromatic in cresyl blue mounts, with a thin endosporial wall layer, the episporium smooth in outline but very conspicuously heterogeneous, consisting of ochraceous brown spinules inserted in pale pink wall substance as in many species of *Crepidotus* and *Porphyellus*, consequently the spores appearing punctate; without germ pore and without suprahilar depression; spore print now between "ferrugineous" and "hazel" (R.), and apparently so when fresh since the dusting as painted in the original painting (Martin 561) is of the same color. Carpophores not preserved, but a good drawing showing carpophores of *Amanita*- habit, white with pink lamellae, white annulus and a well developed membranous white volva (as in *Volvariella*), growing on the ground.

The painting with the spore print represent the type, from Melbourne, Victoria, Australia (K). This was long thought to have been lost, but the spore print provides a possibility to analyze this very interesting fungus, at least partially. Since no data on the structure of the epicutis and the hyphae especially those of the hymenophoral trama can be obtained, the position of the genus in the system of *Agaricales* remains uncertain, but the species is well enough defined by its macroscopical and spore characters to be certain that it is a representative of an independent genus with unique character combinations. If it belongs in the Amanitaceae, it differs from all other genera in the punctate spores. There is, however, a possibility that, in reality, this is a agaricaceous form (or a form belonging to the *Strobylomycetaceae* but even then there could not possibly be any doubt as to its independence from other known genera.

Pluteus Fr.

The type studies referring to this genus will be incorporated in a special paper on *Pluteus*, now in preparation.

Agaricaceae.

Agaricus lignifragus Mont.

The genus *Leptomyces* Mont. is based on this species. *Leptomyces* has been considered a synonym of *Hiatula, Mycena*, etc. but without a type analysis, it is impossible to understand the position of the genus *Leptomyces*. The Paris herbarium does not contain the type of

A. lignifragus; the species is absent at Kew, and in the Farlow Herbarium. Under these circumstances, it must be considered as a nomen dubium, and with it, the genus based on it. From the description one might guess that Montagne had something like the Corrugarias of Métrod and Dennis (see above under *Mycena*).

Chlorophyllum Mass.

Agaricus glazioui Berk., Vidensk. Medd. f. 1879—80: 32. 1880.

The type from Rio de Janeiro (K) has all the characters of *Chlorophyllum molybdites* a was correctly pointed out by Dennis (Kew Bull. f. 1952: 462. 1952). The spores are of the same size as those of *C. molybdites* *).

Ripartitella Sing.

Collybia pseudoboryana Dennis.

The type from South America coincides precisely with *Ripartitella brasiliensis* (Speg.) Sing.

Bolbitiaceae.

Conocybe Fay.

Agaricus umbellula Mont.

Spores 15—17 ⇌ 8—9 μ, bright and deep rusty in NH_4OH, smooth, with distinct germ pore; cheilocystidia ventricose below, with abrupt capitulum (3.5—5 μ); basidia 4-spored; dermatocystidia in the middle of the stipe vesiculose to ampullaceous, non-capitate, intermixed with elongate hyphous hairs arising from a thickened base; NH_4OH not forming needle-like crystals in hymenium preparations. The carpophores are large (size of *C. pubescens* and *cryptocystis*), 10—30 mm. in diameter, stipe 50—80 ⇌ 1—2 mm. (Montagne); the stipe is said to be yellowish, but is now brownish with precipitations of brown pigment on the hyphae; the pileus seems slightly reticulate.

This is the type from French Guyana, Leprieur 978 (PC.). According to the data obtained, there is hardly any appreciable difference between this species and *C. pubescens* (Gill.) Kühner. We have not been able to demonstrate capitate dermatocystidia on the stipe, but they are so scarce to practically absent in some fresh collections that I cannot give much weight to this fact. The habitat (inter folia) may have been rich in dung. The new combination **C. umbellula** (Mont.) Sing. is herewith proposed, and *C. pubescens* appears to be its synonym.

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*) On the other hand, there is a smaller spored species (9,7—10,3 ⇌ 7,3 μ) which may explain the fact that green-spored „Lepiotas" are at times indicated as edible while *C. molybdites* is poisonous. More detailed studies are necessary in order to establish a correlation between the presence of the poisonous matter and the spore size, but it may well be that the type species of *Chlorophyllum* is slightly different from *C. molybdites* (on the specific or varietal level).

Agaricus siennophylla Berk. & Br.

Spores 7—9.5 (10.3—11.7) ⇌ 4.5—5.3 (5.8—6.8) μ, smooth, deep rust color, with distinct and broad germ pore; a minority reaching 10.3 ⇌ 5.8 μ (apparently from bisporous basidia, very few reach 11.7 ⇌ 6.8 μ); basidia 4-spored, a minority 2-spored; cheilocystidia ventricose abruptly capitate apex, the capitulum 3.5—4.7 μ in diameter; dermatocystidia of the stipe all non-capitate, varying from vesiculose to ampullaceous, and intermixed with some „hairs", i. e. with the neck elongated into a hyphous appendage (so in middle of stipe); hyphae of the middle of the stipe with stramineous membrana pigment; NH_4OH not producing needle-like crystals in hymenium preparations.

The type (K) is no. 933 from Peradyniya, Ceylon, Jan. 1869, and is in good condition. It is a species of *Conocybe,* section *Pilosellae,* apparently independent since it has smaller spores than *C. siliginea* and *C. subvelata.* The new combination **C. siennophylla** (Berk. & Br.) Sing. comb. nov. is proposed.

Galerula cryptocystis, Atk.

The type has all characters of *Conocybe megalospora* (J. Schaeffer) Sing., the ex-*pubescens* (Gill.) Kühner, and this species must therefore be renamed **Conocybe cryptocystis** (Atk.) Sing. comb. nov.

Agaricus martianus Berk. & Curt.

Spores 7.2—8.3 ⇌ 4.5—5.3 μ, consisting of a rather pallid, thin endosporium, a rusty colored episporium and a deep rusty brown exosporium forming low warts as in *Galerina*-spores, with a small but distinct germ pore, rough in circumference, ellipsoid, without plage; hymenium collapsed.

This is the type from Cuba (K), Wright coll. It belongs in the subgenus *Ochromarasmius* Sing. of *Conocybe* and should be known as **Conocybe martiana** (Berk. & Curt.) Sing. comb. nov. It is related to *Conocybe radiata* Sing. but differs in much smaller carpophores and lack of a pseudorhiza.

Pholiotina Fayod.

Agaricus striaepes Cooke.

Spores 9 ⇌ 4.5 μ, with germ pore, well pigmented, smooth, with complex wall; basidia 4-spored; cheilocystidia mostly collapsed, one seen (ampullaceous-subcapitate); stipe with dermato-basidia, small versiform dermatocystidia and occasional hyphous outgrowths from the hyphal surface of the stipe proper; hyphae without clamp connections.

This is the type, collected in Kew Gardens and preserved at the Kew Herbarium. It is obviously the same as *Pholiotina pygmaeo-affinis* (Fr. sensu Kühner) Sing. This confirms the synonymy given in Kühner & Romagnesi, Flore Analyt. p. 345, 1953.

Agrocybe Fayod.

Agrocybe sacchari (Murr.) Dennis.

Murrill's original specimens were not studied. Those collected by Dennis and determined as above have all the characters of *Agrocybe fimicola* (Speg.) Sing., four-spored race, and are undoubtedly identical with that species, which, in Argentina, frequently occurs in sugar cane fields.

Agrocybe broadwayi (Murr.) Dennis.

Murrill's original specimens were not studied. Those collected by Dennis have all the characters of *Agrocybe neocoprophila* Sing. based on *Hebeloma coprophilum* Rick non *Agrocybe coprophila* Sing. (1950). The epithet proposed by Murrill, if the corresponding type is identical with the Trinidad collections at Kew, has priority over the new name proposed by me.

Agaricus phylicigenus Berk.

Spores 9.8—12.7 ⇌ 5.8—7.3 μ, smooth, thick-walled with complex wall, melleous-ochraceous, with mostly non-truncate but distinct although narrow germ pore; cystidia present on the sides of the lamellae; epicutis of pileus cellular.

This comes from the material collected during the Challenger expedition (K), type, Oct. 17, 1873. The species is identical with *Agrocybe aegerita* (Brig.) Sing.

Strophariaceae.

Naematoloma Karst.

Agaricus micromegas Berk.

This (type, K) is obviously one of the common Naematolomas near *N. fasciculare.*

Agaricus elongatipes Peck.

This (type NYS) is obviously the species described as *Naematoloma elongatum* by Smith in his excellent monograph of the genus. This species should be known as *Naematoloma elongatipes* (Peck) Sing. according the rules of nomenclature. The type of *Galerula paludicola* Atk. (CU) is also this species.

Flammula brunnea Mass.

The type (K) from New Zealand is a *Naematoloma,* near *N. sublateritium.*

Psilocybe Kummer.

Agaricus udus Pers. ex Fr. sensu Karst., M. F. no. 305.

This specimen, the oldest of interpretations of *Agaricus udus,* as preserved at Kew, shows spores 12.5—19 ⇌ 8 μ, olive brown, with broad germ pore; cheilocystidia ampullaceous or more often ampullaceous-subcapitate, about 43 ⇌ 5.2 μ; basidia 4-spored, few 2-spored; chrysocystidia present, rather numerous, distinct.

This was collected in *Sphagnum,* in Finnland by K a r s t e n, and should therefore be considered as lecto-type of the species. K a r s t e n had exchange relations with F r i e s, and, moreover, worked in a region with similar conditions of climate and forest flora as did F r i e s. Furthermore, I do not know of any older material usable as a means of interpretation of the species. The *Naematoloma,* described by A. H. S m i t h as *Naematoloma udum* (Pers. ex Fr.) A. H. S m i t h should therefore be considered as representative of F r i e s's species in preference to the species described by S i n g e r as *Psilocybe uda* (Pers. ex Fr.) Gillet (Lilloa **26**: 143. 1953), and the latter must be renamend. For the *uda*-like *Psilocybe* without chrysocystidia, the new name **Psilocybe paupera** Sing. is proposed.

P s i l o c y b e p a u p e r a Sing. Species *Naematolomati udo* simillima sed absentia chrysocystidiorum notabilis; sporis 13.8—20.5 ⇌ 6.8—9.7 μ; basidiis 1-, 2-, 3-, 4-sporis. Inter *Sphagna.* Typus: S i n g e r no. B 103, LIL, Taimbesinho, Brasiliae.

Deconica (W. G. Smith) Karst.

A g a r i c u s g o n i o s p o r u s Berk. & Br.

Spores 5.8 ⇌ 5.5 μ, olive colored, rhombic in frontal view, with thick complex wall, with broad germ pore, smooth; epicutis a layer of filamentous repent hyphae with clamp connections.

The type, no. 835 (K), from Ceylon, is udoubtedly a *Deconica* for which I propose the combination **Deconica goniospora** (B. & Br.) Sing. comb. nov. Distinct gleocystidia-like cells were not observed. The species was described as *Flammula,* but has evidently nothing to do with *Flammula* (subgenus of *Pholiota*).

Melanotus Pat.

C r e p i d o t u s r i d l e y i Massee.

This has all the generic characters of *Melanotus* and seems to be a distinct species with a new host for the genus: on dead fern rachis. The combination **Melanotus ridleyi** (Mass.) Sing. comb. nov. is proposed. Type studied at Kew.

A g a r i c u s t u r b i d u l u s Berk. ex Cooke.

This has all the generic characters of *Melanotus hepatochrous* (Berk.) Sing., and may be identical with this particular species. Type (K).

Pholiota Kummer.

A g a r i c u s r u f o p u n c t a t u s Berk. & Br.

The type (K) has all generic characters of a *Pholiota.* No specific determination has been attempted.

A g a r i c u s h e l i o c a e s Berk. & Br.

Spores 6.5—8 ⇌ 3.5—5.3 μ, frontally ellipsoid to ovoid, in profile not reniform, smooth, brownish melleous to ochraceous, with slight

germ pore (a tiny, non-truncate pore); chrysocystidia present, distinct, with yellow inclusion. Aspect of carpophore flammuloid.

This is no. 859, Dec. 1868. The above described portion of the original collections is herewith designated as lectotype. This is a species of *Pholiota,* **P. heliocaes** (Berk. & Br.) Sing.

Agaricus dissimulans Berk. & Br.

Spores 7.2—9.8 ⇌ 5.3 μ, pale brownish, smooth, without distinct germ pore (there is a germ pore but it is very tiny and, because of the thin spore wall, very inconspicuous, not truncate), mostly about 7.5 μ long; basidia 29 ⇌ 7.3 μ, 4-spored; cheilocystidia ventricose, with protracted thin neck and therefore more or less ampullaceous, or with the neck apically subcapitate, hyaline, not incrusted; chrysocystidia none, and generally no cystidia on sides of lamellae; cuticular layer with repent hyphae, all filamentous, forming a cutis, and containing a bright yellow pigment. Appearance of carpophores reminding one of *Agrocybe erebia,* with white basal mycelium.

The type from England (K) is not an *Agrocybe* as one might be inclined to believe when looking at the published illustrations. It is a *Pholiota.*

Agaricus scobifer Berk. & Curt.

The carpophore is strongly squarrose all over. The type from Cuba (K) consists of a single carpophore, growing on wood. This carpophore is immature and does not contain any spores; the structure of the hymenium is obscured by numerous mould spores. This is a nomen dubium.

Pleuroflammula Sing.

Crepidotus austroafricanus Pilát.

The thick-walled, brownish, smooth spores without germ pore measure 9—10.5 ⇌ 6.5—7.3 μ. I was unable to obtain more pertinent characters.

This is the type (K). It is most probably a *Pleuroflammula.* It may be identical with or related to a portion of the material of *Agaricus* (*Crepidotus*) *leptomorphus* preserved at Kew (see under *Crepidotus*).

Incertae sedis:

Pilosace pendolae Speg.

Spores 11.5—15 ⇌ 6.8—9.7 μ, deep chestnut colored, somewhat broader in frontal view than in profile, with broad germ pore, with thick complex wall, smooth; chrysocystidia rather small, numerous, broadly clavate and mostly mucronate, in ammonia showing a yellow internal amorphous body; cuticle of pileus consisting of an epicutis which consists of non-gelatinized filamentous hyphae forming a cutis, and a hypodermium which is also not gelatinized and consists of much broader and less parallel hyphae than the epicutis, but still

not typically vesiculose or making the impression of a pseudoparenchymatic layer.

The type, herb. no. 17012 LPS, coll. A. Pendola, June 1920, with a colored sketch and descriptive notes mentioning traces of an annulus. This species belongs to the *Strophariaceae, Strophariodeae,* and is either a *Naematoloma* or a *Stropharia,* most probably the latter.

Cortinariaceae.

Alnicola Kühner.

Galerula mirabilis Atk.

Spores 14.3—23 ⇌ 7.5—10 μ, sometimes reaching 25 ⇌ 11.2 μ, almond shaped, strongly punctate-warty and occasionally the warts running into each other and forming very short ridges, the ornamentation much deeper colored than the episporium, with a slight perisporial enveloping mass in some spores, with a strong papilla at the apex which is merely a strongly developed callus, without plage; cystidia none; cheilocystidia clavate-vesiculose-pedicellate, hyaline to pale melleous, 35—80 ⇌ 11—13.5 μ; hymenophoral trama consisting of filamentous hyphae which are hyaline or very finely incrusted by punctations from a pale melleous pigment; basidia 2-spored; epicutis formed by cells which make up an epithelium, cells e. gr. 30 ⇌ 21 μ; all hyphae without clamp connections.

This is the type of the Atkinson Herbarium no. 15117, (CU), coll. Whetzel June 17, 1903 in Swamp McLean, N Y., and is accompanied by Atkinson's descriptive notes which, combined with the anatomical data given above, make it absolutely clear that this is not a *„Galerula"* in any sense, but a species of *Alnicola,* more precisely *A. bohemica* (Velen.) Kühner which is antedated by Atkinson's species. Consequently, the valid name for it is **Alnicola mirabilis** (Atk.) Sing. comb. nov.

This species was first described from America by Atkinson, later by A. H. Smith as *Naucoria hamadryas* Fr., specimens of which were received by the author and recognized as the same as *Alnicola bohemica.* This species is rather common in Eastern North America, especially in Michigan where the author made several collections (N 744, N 948, F).

Galera inculta Peck.

The type (NYS) has apparently all generic characters of an *Alnicola,* and is, besides, identical with *Alnicola alnetorum* (Maire in Kühner) Romagnesi. The latter has therefore to be renamed: **Alnicola inculta** (Peck) Sing. comb. nov.

Descolea Sing.

Agaricus recedens Cooke & Mass.

Spores 12.3—13 ⇌ 7—7.3 μ, almond- or boat-shaped, with a slight suprahilar depression, with an apical mucro (callus), rusty punctate

by an exosporial ornamentation on yellow ground (episporium); basidia 31—42 ⇌ 9—10.3 μ, 4-spored; cheilocystidia not recovered; clamp connections present; cuticle of pileus with very broad, subisodiametric cells, broad elongate cells also present, incrusted by a fulvous-ferruginous pigment. The specimens preserved have somewhat the appearance of *Pholiotina blattaria,* the annulus being attached in the middle of the stipe and still very distinct; the lamellae are remarkably spruce yellow, yellow brown, even now.

This is the type from Mordiallac, Victoria, Australia, coll. O. French 1889 (K). The description makes no mention of the tree under or with which it occurs, but since *Nothofagus moorei* occurs in that region in rain forest gullies, I assume that this species grows with *Nothofagus* as does its nearest relative, *Descolea antarctica* Sing. in Tierra del Fuego. *Agaricus recedens* must also be transferred to *Descolea* as **Descolea recedens** (Cooke & Mass.) Sing.

The presence of *Descolea* in Australia is now proved. I have no doubt that it also occurs in New Zealand. The species known are all very closely related. The Australian species would differ from the Fuegian one in the colors described by Cooke & Massee and in being slightly more slender and perhaps with slightly narrower spores. The latter seem to indicate a closer relationship between the Tierra del Fuego *Descolea* than the form occuring further north in Patagonia, a fact that may be of importance when the origin of the disjunction of the geographic area of such genera as *Descolea* is studied. It must be assumed that basidiomycetous genera like this are old enough to have participated in the great Australantarctic flora that once connected both Tierra del Fuego and New Zealand with the antarctic continent, but became separated later on by geological and climatical changes. If this may be assumed to be a valid hypothesis, the further observation regarding the characters of species with area disjunction between South America and Australia becomes rather interesting. In the three best-known cases, we have a Gastromycete close to Agaricales (*Thaxterogaster*), a strongly annulate genus (*Descolea*) and a strongly volvate genus (*Amanita*) of Agaricales. This fits well enough with the author's ideas on the origin of the Agaricales.

Gymnopilus Karst.

Naucoria pellucida Murr. sensu Dennis.

Murrill's type of the species was analysed by A. H. Smith, and found to belong in *Galerina.* The interpretation given in Dennis' paper is different. There are two collections under this name in the herbarium (K), no. 64 A, and no. 64. Dennis tends to assume that no. 64 is a young stage of no. 64 A since both grew at the same locality and are macroscopically very similar. Nevertheless, the spores of no. 64, although they are smooth (as is indeed often the case in

young spores of ordinarily warty-spored species) are larger than those of no. 64 A, and have a germ pore. In spite of the macroscopical similarity and the similarity of the cheilocystidia, I am inclined to think that they are different. Neither one of the two collections is identical with *Galerina pellucida* (Murr.) Smith & Sing. The specimen which I have studied completely is no. 64 A:

Spores 5.3—5.8 ⇌ 4,5 μ, with isolated exosporial warts, short ellipsoid, without germ pore; basidia 6.5 μ broad, 4-spored, pleurocystidia none; cheilocystidia now seemingly versiform, but apparently mostly ventricose with long ampullaceous neck and capitate apex; epicutis of the pileus not strongly differentiated, and consisting of long and rather broad hyphae with frequent septa, incrusted by an ochraceous pigment, repent with occasional hyphal chains slightly ascending, cells 25—120 ⇌ 14—39 μ; hyphae with clamp connections.

This species should be redescribed as new, in *Gymnopilus,* unless type studies on species not revised by me show it to be conspecific with some species already described.

Gymnopilus flavidellus Murr.

The type of this species correponds well with the species keyed out in my key in Lilloa **22**: 565. 1949 (1951) as *G. amarisssimus* var. *subdryophilus.* Since the differences are rather on the specific level, I accept the earlier name for this plant.

Pileus yellow on margin („Chinese y." or „ta ming" M & P), with deep colored center („Punjab" M & P), sometimes entirely „Punjab", on margin sometimes marbled with „Alamo" (M & P), glabrous and smooth, not viscid, somewhat moist, eventually rarely rivulose-rimulose or cracking deeply, exceptionally partially extremely finely appressedly squamulose, convex, eventually often flat, but often with an obtuse umbo, with incurved margin, 27—60 mm. — Lamellae light yellow, then rust-spotted and eventually always deeply and intensely orange-fulvous-rusty (often between „Mars yellow" and „Sandford's brown R. with more or less „auburn" floccons on edge), crowded, in age in large carpophores sometimes becoming subclose, narrow, in large specimens in age often becoming broad, adnate-subdecurrent, or sinuate; spore print „amber brown" with a shade of „Argus brown" (R.). — Stipe pale yellowish, usually staining fulvous brown, often faintly yellowish pruinate-fibrillose, at least at apex, deep brown at base, at least in age solid, 20—60 ⇌ 3—8(10) mm; veil none; basal mycelium white. — Context pale yellow to yellow; odor slight, taste distinctly and strongly bitter.

Spores 7.5—8.3—11 ⇌ 5—5.3—6.8 μ, finely warty from a exosporial ornamentation, well colored, deep rust in KOH; basidia up to 36⇌ 8 μ, 4-spored; cheilocystidia at and near edge among basidia, ventricose below and subcapitate to capitate above, hyaline or pale brownish, about 36 μ long and 7.2—7.5 μ broad; in lamellae-preparations a

yellow pigment invades the medium; hymenophoral trama regular; epicutis of pileus consisting of filamentous repent hyphae, emerging cystidioid bodies absent; all hyphae with clamp connections.

Usually gregarious to subcespitose and by me always found on frondose wood, but apparently also sometimes on coniferous wood, fruiting from May until fall. Michigan (Singer N 474, N 888, N 1163 on *Betula* all F) south to Florida (Singer F 2471, F, and Murrill as type of *Gymnopilus subdryophilus,* FH, FLAS).

The larger spores correspond to my Florida material, and coincide in size with those observed on *G. amarissimus* Murr. In Michigan, the spores were mainly up to 8.3 ⇌ 5.3 µ.

Agaricus amazonicus Berk. ex Cooke.

Spores 7—7.2 ⇌ 5.5—6.2 µ, strongly warty from an exosporial ornamentation, without plage, short-ellipsoid, well colored but not so deeply pigmented as in *Pyrrhoglossum*; cheilocystidia not found; hyphae of the pileus epicutis repent, incrusted, filamentous; hyphae with clamp connections. NH_4OH black on surface of pileus. Lamellae not so deep rust as usual in *Gymnopilus,* but where the spores are massed they are bright rusty. This is a rather naucorioid specimen, apparently evelate with ferruginous fuscous pileus and deep brown stipe, growing on earth (since there are earth particles at the base).

This was described as a *Pluteolus,* but the type from „Panuré" (coll. Spruce, K) is undoubtedly a *Gymnopilus* which is evidently identical with the following species.

Agaricus marasmioides Berk.

Spores 6.5—7.5 ⇌ 5.8 µ. Other characters as above.

The type, Spruce 116 from „Panuré" (K), is a *Gymnopilus,*

Gymnopilus marasmioides (Berk.) Sing. (syn.: *Agaricus amazonicus* Berk. ex Cooke).

Agaricus aureobrunneus Berk. & Curt.

Spores 6.8—8(8.5) ⇌ 4.3—5.3 µ, with relatively low punctiform warts of an exosporial ornamentation, without plage, verrucose to verruculose to (more rarely) almost subsmooth in outline, ellipsoid, with rather deep pigmentation; basidia 23 ⇌ 6.5 µ, 4-spored; cheilocystidia ventricose to subfilamentous but capitate or subcapitate above in many individual cells, more rarely ampullaceous without thickening above, hyaline or yellowish or chestnut incrusted, small, the capitutum about 4—5 µ broad, or smaller; tramal hyphae parallel in the lamellae, with clamp connections. There is no evidence that this grew on monocotyledonous rests, on the contrary, the substratum left seems to be dicotyledonous.

The type (K, FH) from Cuba differs very little from *G. chrysopellus* (Berk. & Curt.) Murr., and was transferred to *Gymnopilus* itself by Murrill which places the species in the correct genus. In *G. chrysopellus,* we have sometimes observed that a minority of

cheilocystidia has subcapitate apex. The problem cannot be solved definitively at present. The species described as *G. aureobrunneus* by Dennis from Trinidad is a species different from the type of *G. aureobrunneus* if one gives any weight to the host. The spores of the Kew type of *G. aureobrunneus* are 7—8(8.5) ⇌ 5—5.3 μ as compared with those of *G. aureobrunneus* sensu Dennis which measure 6.5—7.3 ⇌ 4.4—5.2 μ, and although they appear to be slightly narrower in an average in the latter, the difference is indeed very slight. I am inclined to believe that, at present, the best solution appears to be to refrain from synonymizing the various species involved until further studies show just how constant the differences observed are, and to name the species on Monocotyledones *Gymnopilus earlei* Murr. which is most certainly the same species as that described by Dennis.

Flammula elegantula Mass, Kew Bull. 1914: 359. 1914.

Spores 6.5—7.3 ⇌ 4.5—5.2 μ, warty; basidia 25.5 ⇌ 7.3 μ, 4-spored; cheilocystidia not observed. This grows on dead *Cocos,* according to the type label. This is apparently an older (more fulvous and washed out) stage of *Gymnopilus earlei* Murr.

Gymnopilus chrysopellus Berk. & Curt.

The Kew type was studied in addition to the Farlow type in order to make sure that the type collection is homogeneous. The spores and cheilocystidia (ampullaceous, non-capitate) are the same in both cases, and the carpophores in both herbaria are evidently the same species corresponding perfectly with the full description given by this author in Lilloa **25**: 369. 1951.

Agaricus chrysotrichus, Berk. & Curt.

The type is most probably identical with either *G. chrysopellus* or *G. aureobrunneus.* It is supposed to be different in having free appressed hairs on the pileus, but a microscopical examination of the surface of the pileus of the type (K) shows that the golden hairs of no. 54 consist entirely of mold conidia. Consequently, with the decisive character of the species proved to be of foreign origin, the species, as described, consists of two different organisms and is, according to the rules, a nomen confusum. The agaric is a form probably identical with *G. chrysopellus* (spores 6—7.8 ⇌ 4,3—5.2 μ and cheilocystidia ampullaceous-non-capitate).

Agaricus crociphyllus Cooke & Mass.

The spores are verruculose-punctate, 5.8—7 ⇌ 4.5—5 μ, sligthly roughened in outline, not very deeply rust colored. The carpophores look sometwhat like very old *G. spectabilis,* but the spores are different. The type (K) cannot be determined with any degree of certainty, although it is undoubtedly a representative of the genus *Gymnopilus.*

Agaricus purpuratus Cooke & Mass.

Spores 8—9 ⇌ 4.8—5.5 μ, with a rather conspicuous warty exosporial ornamentation, without plage, well pigmented; basidia 21.3 ⇌ 7.3 μ, 4-spored; cheilocystidia ventricose below, with a cylindrical neck and capitate apex, 20—25 ⇌ 3.8—6.5 μ, neck 1—2.8 μ in diameter, capitulum 4.5—5.8 μ in diameter; hyphae with clamp connections.

The type, on fern stems in England (Kew), as preserved at K, is a naucorioid species of *Gymnopilus,* with characteristic macroscopial characters, bitter taste, and should be known as **Gymnopilus purpuratus** (Cooke & Mass.) Sing. It is close to but different from *Gymnopilus luteofolius* (Peck) Sing. (cf. Revue de Myc. **18**: 19. 1953).

Agaricus filiceus Cooke.

Spores 7.3—7.7 ⇌ 4.5 μ, moderately strongly warty from an exosporial ornamentation, without plage, with isolated warts, rather well pigmented; basidia 23 ⇌ 6.5 μ, most hyaline, fewer chestnut incrusted (resinous), 4-spored; cheilocystidia mostly collapsed, seemingly both ampullaceous and capitate ones present; hyphae with clamp connections. Carpophores rather small to medium sized; turning rust (deep and vivid rust color) in KOH and exuding a yellow sap. The original painting by Cooke shows close subdecurrent yellowish lamellae, a distinct trace of an annulus, pale yellow stipe, and rusty brown squâmules on yellow ground on the cuticle of the pileus. On stump of *Cyathea dealbata* in a greenhouse in England.

This is the type (K) which is undoubtedly different from other species of the same genus known to me, and should be known as **Gymnopilus filiceus** (Cooke) Sing. comb. nov. It has nothing to do with the red-scaly species, and would key out with *G. chrysopellus* from which it differs in the shape of the exosporial ornamentation, closer lamellae and perhaps the structure of the squamules and the shape of the cheilocystidia. It is kept apart from *G. chrysopellus* mainly because of the habitat, but is as close to it as *G. earlei* (see above).

Agaricus oxylepis Berk. & Br.

Spores 6.2—7.3 ⇌ 5—5.2 μ, distinctly warty, with rather isolated and strong, well colored exosporial warts, without plage; cheilocystidia not studied. The carpophore is slender, small, habit of a small *Lepiota,* with apical, distinct, distant annulus, with strictly erect spiniform squamules.

This is the type (K), no. 907, Peradiniya, Ceylon. It is a good species of *Gymnopilus,* **G. oxylepis** (Berk.) & Br.) Sing. comb nov.

Agaricus trailii Berk. & Cooke.

Spores 5.5—6 ⇌ 4.5 μ, verrucose from isolated exosporial warts, deeply and intensely rusty colored in KOH; cheilocystidia not with certainty establishable, apparentlny vesiculose below with long „neck" which is slightly or not thickened toward apex but not sub-

capitate or capitate, 32—33 ⇌ 6.5 μ „neck" 3 μ thick; hyphae with clamp connections. The carpophore is almost closed although the hymenium is mature, pileus surface strongly squarrose, dry, stipe woolly-scaly; annulus yellowish, simple, distinct.

The type (Trail, from Teffé, Brazil, K) consists of a single carpophore, but the macroscopical characters in connection with the small spores make it possible to recognize this as an autonomous species of *Gymnopilus,* **G. trailii** (Berk. & Cooke) Sing. This might be an earlier name for *G. zenkeri* (Henn.) Sing. which is somewhat larger, with very slightly larger spores, a condition easy to explain by the fact that the Trail type is still rather young. Good material of what I believe to be the same as *G. zenkeri* was collected by Harley at Ganta, Liberia. The cheilocystidia of the African specimens were 20—28 ⇌ 6.8—7.5 μ, ventricose-ampullaceous with capitate apex; spores 5.8—6.5 ⇌ 4—4.8 μ. Further studies on South American specimens, when available, will show how constant these differences are. At any rate, the two species are closely related.

Agaricus crocias Berk. & Br.

Spores 7.5 ⇌ 4.7 μ, appearing smooth, but very finely punctate from an exosporial ornamentation, without plage, without suprahilar depression, comparatively poorly pigmented because of the weak ornamentation; cheilocystidia ventricose at the base, with a long „neck" which is subcapitate at the apex or equal (ampullaceous-non-capitate type). Aspect of carpophores as in *G. peliolepis* (Speg.) Sing. but the scales dark rusty rather than red (although there is no evidence that they have not been red when fresh, or when the carpophores were fresh).

The type, no. 1126 from the Central Prov., Ceylon (K) is well preserved and should be considered as a good species of *Gymnopilus* in view of the punctate spores. It grew on what appears to be dicot wood. The combination **Gymnopilus crocias** (Berk. & Br.) Sing. comb. nov. is proposed for this species.

Pyrrhoglossum Sing.

Agaricus holocrocinus Berk.

Spores 5.5—6.2 ⇌ 4.2—4.5 μ, with verrucose exosporial ornamentation, warts isolated, plage none; hyphae with clamp connections. Carpophore rather large, with eccentric stipe and very crowded lamellae, on wood.

This is the type, coll. Gardener at Ambegamoa 1846 (K). In view of the eccentric stipe, the relatively small and short strongly ornamented spores and the crowded lamellae I consider this as a species of *Pyrrhoglossum* rather than *Gymnopilus*. The combination **P. holocrocinum** (Berk.) Sing. comb. nov. is proposed.

Crepidotus substipitatus Murr.

Spores 4—6 ⇌ 3.7—4.3 μ, strongly warty, deep rich ferrugineous fulvous, without plage. Macrospopically like *Pyrrhoglossum pyrrhus*. The type from Cuba (NY) is a synonym of the latter species.

Crepidotus sarawakensis Pilát.

The type (K) from Borneo, collected by Beccari and determined by Cesati (as *Agaricus mollis*) has small ovoid-subglobose spores (4.5 ⇌ 3.7 μ), strongly warty, deep rusty, and belongs in *Pyrrhoglossum*. It is, however, not very similar to the Asiatic species (*P. hepatizon*) but rather resembles the American short-stemmed type of the genus, *P. pyrrhus*. A more detailed description would be necessary to judge whether it is identical with the latter, or not.

Pyrrhoglossum stipitatum Sing., Sydowia **2**: 38. 1948.

A comparison of the type with material collected by Dennis in Trinidad (Bull. Soc. Mycol. Fr. **69**: 174. 1953) as *Pyrrhoglossum hepatizon* (see also Singer, Sydowia 5: 474. 1951) shows that the Trinidad species is identical with *Pyrrhoglossum stipitatum* rather than with *P. hepatizon*.

Galerina Earle.

The type studies referring to this genus will be incorporated in a monograph by A. H. Smith & Singer (in press).

Phaeomarasmius Scherffel.

Agaricus curcuma Berk. & Curt.

Spores 7.3—9.8 ⇌ 4.5—5 μ, mostly 8.3—8.8 ⇌ 4.3—4.8 μ, smooth, relatively well colored but with rather thin although not collapsing walls, pale rust color, suddenly contracted to a subacute apex when seen in frontal view and therefore at times almost appearing subangular, or almond shaped, in lateral view the inner side entirely applanate or very slightly concave; basidia 20—27 ⇌ 5.8—7.5 μ, (1)2—(3)—4-spored; cystidia none; cheilocystidia 20—58 ⇌ 4.5—11 μ, clavate, rarely almost vesiculose, cylindrical, or cylindrical-subcapitate, hyaline, few brownish, often with a small mucro, making the gill edge heteromorphous; hymenophoral trama regular; epicutis of pileus consisting of hyphal chains whereby many members of the chain are strongly shortened and almost subisodiametrical, 4.5—25 μ broad, the terminal cells varying from subulate or cylindrical to vesiculose-subclavate (37—41 ⇌ 17.5—19 μ) or even subglobose (e. gr. 33.5 ⇌ 25 μ), but basically elongate rather than forming an epithelium, nevertheless unusually variable; all hyphae with clamp connections, those of the cuticle strongly rusty pigment-incrusted. Carpophores between small and medium sized, naucorioid.

The type, no. 2913, from South Carolina (K, FH) is in good condition. It is close to *P. muricatus* (Fr.) Sing. (*Pholiota muricata* (Fr.) Quél.) (which see Lilloa **25**: 387. 1951), but differs in less cellular epicutis and in the shape of the cheilocystidia, also in slightly longer

spores. It differs from the species (incorrectly as it seems*)) described as *P. erinaceellus* by Singer & Digilio (Lilloa **25**: 395. 1951)., in different cheilocystidia and a larger proportion of spherocysts in the cuticle. The species called *Naucoria curcuma* by Murrill (F 10003 from Kelley's Hammock, Alachua Co., Fla.) has non-reniform spores 6.5—7.3 ⇌ 4.2—4.5 μ, a truly cellular cuticle and (subcylindrical to) clavate cheilocystidia of 50—72 ⇌ 5.8—10.2 μ. It is a form of the rather polymorphous *Phaeomarasmius gracilis* (Quél.) in the sense of Romagnesi.

Crepidotaceae.

Crepidotus.

Agaricus auricula Berk. ex Cooke.

The type (K) from Tasmania has deteriorated so it can no more be analyzed. A nomen dubium.

Crepidotus citrinus Petch.

Spores 7—8 ⇌ 7—8 μ, globose, with strong imbedded spinules slightly projecting beyond the episporium so that the spore surface appears rough in optical section (oil immersion); clamp connections present. Carpophores more or less attached to substratum by a felty surface; no stipe.

The data indicated above refer to the type no. 3547 from Ceylon (K), collected by Petch August 29, 1912. There is also authentic material, collected September 11, 1916, no. 4874 in which the spores

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*) The true *Phaeomarasmius erinaceellus* (Peck) Sing. has the following characters:

Pileus „samovar" to „honey middle stone" in ground color, with deeper colored (pl. 15 J 12, M &P) pyramidal granules which, again, have deeper colored apices and are detersible (much more so than in the species described by Singer & Digilio under this name), semiglobose-convex. neither umbonate nor umbilicate, 15—22 mm. broad. — Lamellae „honey sweet" (M & P), close or subclose, ventricose, broad, with whitish edges, 3,5 mm. broad, adnate. — Stipe concolorous and with the same covering as the pileus, the latter also covering the lower side of the veil (if present), the apex subfibrillose and straw colored, entirely stuffed, equal or very slightly taoering, downward, 27—28 ⇌ 2—3 μ; veil almost annular or merely forming a sharply delimited zone at the apex; basal tomentum sordid whitish yellow. — Context mild. — Spores 6—8,3 ⇌ 3,8—4,8 μ, usually narrow, with applanate to concave inner side, well colored, smooth; basidia 24 ⇌ 6,8 μ, 4-spored; cheilocystidia 50—55,5 ⇌ 7,5—10,3 μ clavate to clavate-subcapitate, hyaline or with brownish contents, often wavy below; epicutis of pileus consisting of cells with or without a more elongate terminal member (even ampullaceous, e. gr. 42 ⇌ 18 μ), cells 24—27 ⇌ 13,5—20,5 μ, with pigment plaques, easily coming apart at the septa forming loose cells in the preparations, originally arranged in connivent erect chains; covering of stipe formed by similar structures but the elongate cells here dominating, few spherocysts present all hyphae with clamp connections.

On rotten wood, near Pellston, Emmet Co., Mich., U.S.A. July 9, 1953, coll. Singer, conf. A. H. Smith (who has seen the type).

reach 7.2 μ in diameter and are not all geometrically globose but practically globose to subglobose, also with clamp connections. The two collections are not only identical with each other, but they are also identical with the Argentine collection reported under this name by Singer (Rev. Myc. **18**: 22. 1953). A very similar species, possibly a two-spored form of *C. citrinus,* was described by Imazeki & Toki (*Crepidotus sulphurinus* I. & T., Bull. Gov. For. Exp. Sta. Tokyo **67**: 38. 1954).

Agaricus leptomorphus Berk.

Spores 7.3—9.8 ⇌ 4.5—6.5 μ, punctate, immersed punctations not or scarecely projecting and not of deeper rust color than the episporium in NH_4OH; clamp connections present. The accompanying sketch by Archer shows a carpophore of the size of a larger *C. sphaerosporus* with dull ochraceous pallid pileus, dull ochraceous lamellae and no stipe; the pileus is slightly striate, with white dorsal mycelium; context white. The dried material shows a slightly tomentose pileus; it grows on dead dicot wood.

There is a second collection, aside from the type (K), which does not seem to have anything to do with the type. It has larger deep melleous spores with thick walls, and hyphae with clamp connections. It is closely related or identical with *Crepidotus austroafricanus* Pilát, see under *Pleuroflammula.*

The type collection and picture are identical, in almost every regard, with the Patagonian collections of *Crepidotus sphaerosporus* reported by Singer (Rev. Mycol. **18**: 23. 1953, referring to the type of that species, and Sydowia **8**: 13. 1954, referring to the collections from Neuquén, Patagonia). If the entire group of forms now combined in the species *C. sphaerosporus* is considered as a single variable species, *C. leptomorphus* (Berk.) Sacc. is the valid name for all its representatives since I can see no fundamental difference between the type of the latter species and the type of *C. sphaerosporus.* It is, however, possible to consider these forms as microspecies forming a stirps together with *C. eucalypti* (Torr.) Sing. and *C. cesatii* (Rab.) Sacc. This possibility deserves to be investigated before the European name (*C. sphaerosporus*) is dropped into synonymy with the Tasmanian one.

Agaricus phaeton Cooke & Mass.

The type (K) is in rather poor condition and was therefore not analyzed.

Agaricus stromaticus Cooke & Mass.

Spores as in *C. nephrodes,* strongly punctate and somewhat rough, about 7—7.5 μ in diameter; clamp connections present. A thin membranous hyaline mycelial mat is still visible; lamellae broad.

This is the type (K). It is so close to *C. nephrodes* that the „stroma" from which it grows hardly justifies a specific separation.

Agaricus inandae Cooke.

This agrees with the preceding species in every particular, including the now weak sordid whitish mycelial mat from which the carpophores develop. The type (K) was compared with the type of *A. stromaticus,* and no differences could be discovered.

Crepidotus subaffinis Pilát.

Spores 7.3 ⇌ 5.3 μ, or 6.5 ⇌ 4.7 μ, smooth, without germ pore and with homogeneous walls, brownish melleous; hyphae without clamp connections; no gelatinous layer demonstrable. The lamellae are close, almost crowded, and the carpophores are relatively large.

The type (K) from Chamarel, Mauritius, coll. H. H. Johnston no. 10, was described by the collector as „whitish on both surfaces". The size of the carpophores and the closer lamellae seem to set it apart from *C. sublevisporus* Sing. The latter was also collected by Dennis and described by him as *C. albidus* Ellis. However, it cannot be that species because of the absence of clamp connections on the hyphae of the Trinidad material (K).

Crepidotus truncatus Petch.

Spores 5.8—6.5 μ in diameter, globose, with a distinct ornamentation of deeper rusty, constrasting spinules which scarcely project beyond the surface of the episporium; hyphae with clamp connections. The brown color of the pileus is due to spore masses deposited there but the cuticular hyphae are hyaline.

The type seems to be either *C. applanatus* or *C. nephrodes.*

Crepidotus velutinus Petch.

Spores 9—11 μ in diameter, globose, verrucose-punctate, without plage, some punctations prolonged into very short ridges. NH_4OH on carpophores: black. The structure of the carpophores is completely destroyed by moulds.

This is the type (K) from Ceylon. The spores are most extraordinary for *Crepidotus,* but they may pass as a giant type of spores of the kind found in *C. nephrodes.* It appears desirable to recollect this species in order to provide better material for an anatomical redescription.

Aschersonia mellea Berk. & Br.

Spores 5.8—7.3 ⇌ 4.8—5.2 μ, smooth with homogeneous walls; epicutis very thin, almost as in the type of *C. uber,* not gelatinous but beneath it there is a broad gelatinized zone which occupies more than half of the trama of the pileus; hyphae of gelatinized zone hyaline, about 1.5 μ broad; all hyphae without clamp connections.

The type, Thwaites no. 730 (K) was recognized as a *Crepidotus* by Petch and transferred by him. Pilát who revised both the type and Petch's collections also recognizes this species cor-

rectly as *C. melleus* (B. & Br.) Petch. It differs from the closely related *C. uber* (B. & C.) Sacc. in having smaller spores.

Rhodophyllaceae.

Rhodophyllus Quél.

Pluteus grandis Peck.

The type of that species (NYS) is a *Rhodophyllus*. Since it may have been described under another name before, I do not wish to transfer it now.

Marasmius arachnoides Berk. & Curt.

Spores 7.8—8.5 ⇌ 6 μ, angular, of the symmetrical type, pinkish stramineous. There are two tiny carpophores. The arachnoid mycelium is not well visible at present.

The type (FH) is undoubtedly a *Rhodophyllus*. Dr. Dennis kindly told me that he has arrived at the same conclusion after studying the Kew type of the same species.

Rhodocybe Maire.

Agaricus noveboracensis Peck.

A large collection of this species in Massachusetts convinced the author that this species is distinguishable from *R. mundula*. However, more collections in northern Michigan and a comparison with the type material (NYS) seem to prove that none of the characters distinguishing the two species can be considered as constant. Consequently, *A. noveboracensis* Peck must be reduced to the synonymy of *R. mundula*.

Paxillaceae.

Cheimonophyllum Sing. gen. nov.

Genus Paxillacearum, habitu pleurotoideo, carpophoris mollibus, pigmento destitutis, hyphis tenerrimis, fibulatis, inamyloideis, basidiis sporisque hyalinis, inamyloideis; hyphis tramatis hymeniophoralis tenuibus tenui-tunicatis haud intertextis, regulariter vel subbilateraliter dispositis; sporis globosis vel subangulato-globosis, hyalinis, tenuiter vel subtenuiter tunicatis, inamyloideis, levibus; cystidiis nullis, sed hyphis cheilocystidialibus tenuibus, eis cuticulae pilei simillimis praesentibus. Typus generis: *Agaricus candidissimus* B. & C.

Agaricus candidissimus Berk. & Curt.

The type has all the characters enumerated above. The spores are 6—7.5 ⇌ (5.3) 6—6.7 (7.5) μ, hyaline, in alkali with thin to moderately thin (as in *Rhodophyllus*) walls, smooth, non-amyloid; cuticle of pileus made up by a trichodermium of very thin, thin-walled, more or less interwoven, hyaline filamentous hyphae with needle sharp to more rarely subacute tips, 1.5—3 μ diam.; similar hyphae making the gill edge heteromorphous; hyphae loosely arranged, non-amyloid, all hyaline and thin-walled.

This is Sprague 1157 (FH). Identical material was collected by the author in Michigan (N 79, N 455, here spore print pure white), the Caucasus (as *Pleurotus septicus,* (W.) det. Pilát as *P. candidissimus*); material determined or revised by the author: Leg. Farlow, Sept. 1889, Shelburne, N. H., USA (FH); Leg. Linder, Maine, USA: leg. Doty, 723 Alsea Mts., Oregon USA (F), Trinidad, leg Dennis (spore print pure white).

Dennis was the first to indicate the exact color of the spore print which is white. This species has, however no relatives among the*Tricholomataceae, Hygrophoraceae, Amanitaceae,* and *Agaricaceae.* Schematically, it would key out in the *Tricholomataceae,* but it seems that the relatively closest group is the genus *Hygrophoropsis* which has the same consistence, spore color, etc., and a similar structure (trichodermial cuticle, hyphae with thin walls and clamp connections, tramal structure, etc.) It is not submitted that the position proposed for the new genus is an ideal solution, or that the affinity with *Hygrophoropsis* is very striking. Nevertheless, there is a possibility that an evolutionary line, leading from *Paxillus* by way of *Hygrophoropsis* toward the *Hygrophoraceae* or *Tricholomataceae,* finds itself expressed, at a certain level, by forms like the new genus proposed above. This hypothesis may explain the lack of white-pored agaricoid *Gastromycetes,* and one may suppose that the *Tricholomataceae* and *Hygrophoraceae* are derived from the complex of families formerly combined as Boletineae of which the *Paxillaceae* are an integral part. However this may be, *Agaricus candidissimus* is a very characteristic and rather isolated species, and cannot be forced into one of the existing genera. We redescribe it, under the name **Cheimonophyllum candidissimum** (Berk. & Curt.) comb. nov., in a forthcoming paper.

Paxillus Fr.

Agaricus veluticeps Cooke & Mass.;
Crepidotus pactolus Cooke ex Pilát.

The types (K) of the two species mentioned above are identical with each other, and, obviously, with *Paxillus infundibuliformis* Clel. — Spores 13—16 (18.3) ⇌ 4.5—5.2 (6.3) μ, smooth, fusoid to cylindrical, golden melleous, the largest ones with thick but rather homogeneous wall without germ pore, with suprahilar depression; basidia 33.5—48 ⇌ 7.3—9 μ, hyaline, 4-spored; cystidia, if present, inconspicuous; hyphae hyaline to pallid melleous, with numerous clamp connections. Pileus deep brown and velutinous, lamellae "chrome yellow" (according to the collector); appearance of a *Paxillus.*

The correct name for this Australian species is **Paxillus veluticeps** (Cooke & Mass.) Sing. comb. nov. It has the elongate spores of *Paxillus defibulatus* (but with clamps) and *P. boletinoides*

(but without veil) and corroborates again the similarity between the fungous floras of Patagonia-Tierra del Fuego on one hand and Australia-New Zealand on the other.

Boletaceae.

Phaeogyroporus Sing.

Boletus sudanicus Hariot & Pat., Bull. Mus. Hist. Nat. p, 95. 1909 sensu Heinemann (ut *Phlebopus*).

This species was studied by Heim, and Heinemann based his descriptions partly on the data published by Heim. His interpretation is apparently correct.

Spores in shape and color typical for *Phaeogyroporus* 6.5—8.3 ⇌ 5.2—6.5 μ, smooth; hyphae of the carpophore including the basal tomentum with numerous clamp connections. Habit of *Phaeogyroporus;* basal tomentum olive colored.

Heinemann (Bull. Jard. Bot. E. 24 (2): 113. 1954) indicates "hyphae not clamped", a statement based on the material analyzed above (K). Because of an error of observation in this case as perhaps in analogous ones, Heinemann comes to the conclusion that *Phlebopus* and *Phaeogyroporus* are identical. This may be so, provided that the type material of *Phlebopus has* clamp connections. I was unable to study the type of *Phlebopus colossus* Heim at Paris, but the other species inserted by me in this genus (*Phlebopus*) are clampless, and in Heim's account I find nothing to indicate that his species has clamps. The two genera, as proved by the presence of clamp connections in Heinemann's material of *P. sudanicus* are undoubtedly distinct if accepted as described, and if *P. colossus* should turn out to have clamped hyphae in spite of indications to the contrary in Heim's account, there would still be a genus related to *Pulveroboletus* with clampless hyphae and most definitely different from *Phaeogyroporus*. I am still firmly convinced that the presence and absence of clamp connections is a character of major importance in the classification of the *Boletaceae* although it is a character requiring much time and patience on the part of the taxonomist using it. This is particularly so in case of a negative result which, aside from errors of observation, may also occur (in rare cases) as a consequence of the existence of occasional parthenogenetic forms, and a negative result should always be rechecked on material from another source.

Boletus sudanicus is, therefore, a species of *Phaeogyroporus*.

Phylloporus Bres.

Agaricus hypericon Cooke & Mass.

Spores 11.5—14.7 (16.5) ⇌ 6.5—7.2 μ, rather pale melleous-straminеous to subhyaline, often opalescent, thick-walled but with apparently simple wall, without germ pore, smooth, with or without a suprahilar applanation; basidia clavate, 9.2 μ broad; cystidia fusoid-

ventricose, obtuse, hyaline, sometimes slightly thick-walled (up to 1 μ diam.), about 43 ⇌ 16 μ; small transversal squamules of the stipe ocher yellow, consisting of dermatocystidioid clavate elements chich are smooth, about 38 ⇌ 12.3 μ; hypae without clamps at most septa, at some septa possibly clamped.

The type from Melbourne, Australia, coll. Reader, June 9, 1887 (K), is in good condition and looks somewhat like a *Paxillus,* but, according to the analysis given above, belongs in *Phylloporus.* This is corroborated by the fact that the species was apparently redescribed by Cleland under the name *Phylloporus paradoxus* (Kalchbr.) Bres. Cleland mentions a greenish tint below the gills which points at blue autoxidation of the context. The combination **Phylloporus hypericon** (Cooke & Mass.) Sing. comb. nov. is proposed.

I have also restudied the type (K) of *Paxillus muelleri* Berk. but find it rather difficult to place that species in the classification. The spores are in color and shape more convincing as *Paxillus*-spores than spores of a bolete. I found many septa without clamps, but am not certain wheter the species is really clampless. The spores are 10.8—13.8 ⇌ 5.3—6.5 μ, smooth, much deeper brownish melleous than those of *Phylloporus hypericon;* basidia 36 ⇌ 6 μ, 4-spored; cystidia clavate, e. gr. 43 ⇌ 10 μ. Carpophores look like *Paxillus involutus.* This is most likely to be a true *Paxillus,* near *P. defibulatus* Sing. from Patagonia.

A second collection of *Agaricus hypericon* (K) comes from New Zealand, coll. Colenso. This is not identical with either of these species, but belongs in *Gymnopilus.*

Paxillus viridis Berk.

Spores 9—10.7 ⇌ 4.7—5.2 μ, ellipsoid-oblong to cylindrical or slightly fusoid, smooth, light melleous, without germ pore; cystidia numerous, versiform, chestnut colored inside; hyphae of the hymenophoral trama arranged in the *Phylloporus*-manner; all hyphae without clamp connections.

The type from Rio Negro, Brazil was collected on the ground in the forest and the collector, Spruce, indicated the color: "Planta tota viridis". It is difficult to decide wheter this color was present before autoxidation took place. If it is the result of autoxidation, it is probable that *Paxillus viridis* is the same as *Phylloporus rhodoxanthus* ssp. *foliiporus* (Murr.) Sing. Therefore, no transfer to *Phylloporus* is proposed at the present time although the species belongs there without any doubt.

Suillus S. F. Gray.

Pulveroboletus trinitensis Heinemann, Bull. J. Bot. E. 24 (2): 121. 1954.

Spores smooth, 10.3—11.8 ⇌ 4.5—5.5 μ, rather pale melleous; cystidia ampullaceous, 51 ⇌ 17.5 μ, with melleous to chestnut colored

resinous incrustation; clamp connections none; the strongly projecting ridges on the stipe do not show on the type specimen and were not observed on the fresh carpophores.

The type from Trinidad (K), with its red hymenophore is so close to *S. piperatus* that it is more a question of species identification than of generic position. The species belongs undoubtedly in *Suillus*, sect. *Piperati*.

Boletus grevillei Klotzsch.

Klotzsch's type, with the original description and reference to Greville's *B. luteus* (which is *S. grevillei*) is still preserved at Kew. The specimens have all characters of the species often called *Boletus elegans*. It is *Suillus grevillei* (Klotzsch) Sing.

Boletus Dill. ex Fr.

Strobilomyces fasciculatus Cooke & Mass. Grevillea **20**: 4. 1891.

The spores of the type from Australia (K) are smooth, very pale melleous, about $9 \rightleftharpoons 4.8$ µ. This is not a *Strobilomyces*, but rather a *Boletus*.

Tylopilus Karst.

Ixechinus minus Heim, Rev. Mycol. **4**: 20. 1939.

There is a specimen under this name, dried in the normal way, which seems to be part of the original collection (PC) and referring at the same time to another specimen („Un autre examplaire en formol. 19. 2. 38" Decary) which must have been the one studied by Heim. The dried specimen studied by me was determined *Ixechinus minus* Heim and must be considered at least as an isotype. This specimen does not show any tendency toward separation of the tubes, and seems to be a very normal representative of the Boletaceae, in fact most probably a *Tylopilus* if the pores „nettement rosées" (Decary) may be taken as indication for the color of the spore print. Under the circumstances, one cannot help but assume that the separation of the tubes in *Ixechinus* is an artefact, and that the genus is most probably a synonym of *Tylopilus*. If this should be proved to be the case, a new name becomes necessary for the Madagascarian species since a *Tylopilus minor*, different from Heim's material, exists already (*T. minor* Sing., Mycol. **37**: 799. 1945).

Strobilomycetaceae.

Strobilomyces Berk.

Strobilomyces velutipes Cooke & Mass., Grevillea **18**: 5. 1889.

Spores about $9 \rightleftharpoons 6.8$ µ, finely punctate because of very thin, short spinules inserted in the episporium. Pileus with relatively small appressed or obliquely ascendant squamules, especially in the outer third.

The type was collected by Bailey at Brisbane, Australia (K). The data obtained from it coincide very well with those published on the basis of a type fragment preserved at NY and mentioned by me in my bolete monograph, part I (Farlowia **2**: 113. 1945).

Strobilomyces nigricans Berk., London J. Bot. 4: 139. 1852.

Spores 13—16 ⇌ 12.3—14.5 μ, with a wide mostly not quite complete network formed by anastomosing thin but very high (1.5—2.9 μ) ridges which frequently perforate the perisporium, deep brown on paler ground, perisporium hyaline. The specimens are still squamose in the center; the stipe was apparently squarrose all over. Clamp connections none.

The type, no. 4, from Khasia, India (K) is different in spore characters from the species described under this name by Patouillard and commented on by me (l. c. p. 114), although *S. floccopus, B. nigricans* sensu Pat., and the type of the latter species are all closely related. A good species of *Strobilomyces,* well illustrated by Hooker's original picture.

Strobilomyces polypyramis Hooker fil. in Berk., Hook. J. Bot. **3**: 78. 1851.

Spores 11.5—13 ⇌ 10.3—12.3 μ, spinose or with occasional very short ridges among the spines, the spines equal and very high (1.8—2.9 μ). The carpophores are larger than those of *S. nigricans* and *S. montosus,* but the pyramidal ornamentation of the pileus, apparently being detersile, has been lost in the herbarium.

This is the type, no. 104 from Sikkim, India (K), accompanied by an original painting (also at FH). The spore ornamentation is similar to that of *S. confusus* Sing. but considerably more projecting. The two species are apparently different.

Strobilomyces montosus, Hook. J. Bot. **3**: 78. 1851.

Spores 10.3—14.5 ⇌ 9.7—12.7 μ, slightly rugulose from a very low and wide network of darker lines; hyphae without clamp connections. Pileus with high, floccose (soft), but not very easily detersile, erect scales, strongly shaggy even now; stipe also squarrose.

The low, relatively wide reticulation on the rather large spores characterizes the type of this species (K), F. Uapahar, no. 121.

Porphyrellus Gilbert.

Boletus lacunosus Cooke & Mass., Grevillea **18**: 5. 1889.

The species had to be renamed for nomenclatorial reasons (*Porphyrellus cookei* (Sacc. & Sydow) Sing.). It is closely related to *P. malaccensis* and *P. subflavidus.*

The type from Brisbane, Australia, no. 649 (also syntypes 670, 664, several fruiting bodies) is in good condition (K).

Spores 14.5—23.2 ⇌ 9.5—13 μ, with finely spinulose ornamentation which projects 1.2—1.5 μ and is imbedded in the outermost wall layer

which is hyaline and seems to be the perisporium, mucronate at the apex but without germ pore and smooth at the apex thus showing a characteristic smooth snout, most frequently about 17.5 ⇌ 9.2 μ.

These data confirm the statement made by Cooke and Massee that the spores are 15 ⇌ 10 μ large, and consequently corroborate my own disposal of this species as a valid species of *Porphyrellus*. Another similar bolete, *Boletus megalosporus,* exists only as a picture at Kew. The spores are probably foreign, as discribed. With this scanty documentation, it seems to be best to consider *B. megalosporus* a nomen dubium or nomen confusum.

Boletellus Murr.

Strobilomyces ligulatus Cooke, Grevillea **20**: 4. 1891.

Spores 20—24.5 ⇌ 8—12.5 μ, entirely like those of *B. ananas* with the same secondary striations running transversely on the longitudinal wings and between them, but very slightly larger (as already indicated by me under *B. ananas,* Australian collections, Farlowia **2**: 125. 1945). All other characters, including the macroscopical ones, agreeing with those of *B. ananas.*

The type from Australia (Victoria) (K), represents what may be termed the Australian race of *B. ananas.* Further macroscopical studies will be necessary in order to prove that the Australian race is worthy of as subspecific name.

Strobilomyces pallescens Cooke & Mass., Grevillea **18**: 5. 1889.

The part of the type preserved at NY was already studied by me (Farlowia **2**: 125. 1945). The Kew type coincides with the New York fragment in every particular. The species is the same thing as *S. ligulatus* Cooke (see above).The American (slightly smaller spored) race was recently found by Martin & Welden in Panamá (no. 8198, trail from Casita Alta to Finca Lérida, Aug. 2, 1952, det. R. Singer) which extends its American area south to the American tropics.

Boletus ananaeceps Berk., Linn., Soc. Lond. J. Bot. **13**: 161. 1873.

Spores 18—23 ⇌ 6.5—6.8(7.3) μ, cylindrical, with longitudinal wings, wings not striate.

This is the type from Victoria, Australia (K). According to the accompanying picture no. 612, the context turns reddish, then bluish and at length brown; the pileus is whitish with obtuse tall warts. The spores are said to be orange brown but are painted ochraceous, the tubes are very long and the stipe is white. The species has been transferred to *Strobilomyces* by Saccardo. It is indeed a species of *Boletellus* and should be known as **B. ananaeceps** (Berk.) Sing. comb. nov. It differs from *B. ananas,* which has a more than superficial similarity, by the smooth wings of the spores and apparently

also by the shape and color of the ornamentation of the pileus.

Boletus emodensis Berk., Hook. Journ. Bot. **3**: 48. 1851.

Spores as in *Boletellus ananas*, and as discribed in Singer, Farlowia **2**: 126. 1945, as *Boletellus emodensis* (Berk.) Sing., where the species was correctly interpreted.

Strobilomyces paradoxus Mass., Bull. Misc. Inf. Bot. Gard. Kew for 1909: 209. 1909.

Spores 18.2—21.2 ⇌ 8 μ, longitudinally winged with transversely striate wings projecting 1.3 μ and slightly spiralling. Veil grossly toothed, appendiculates on the margin and projecting. Carpophores medium sized, smaller than those of *B. emodensis*.

The type, Ridley no. 28 (K) has the same small scales as *B. emodensis* which has the same spores as described above although they appear to be narrower in *S. paradoxus*. Massee's spore measurements are completely wrong. Since the tropical species differs from *B. emodensis* also in color, this seems to be a good species of *Boletellus* which was correctly transferred to *Boletellus* by Gilbert (1931).

Strobilomyces rufescens Cooke & Mass., Grevillea **18**: 5. 1889.

Spores much like those of *B. ananas* but with smooth wings projecting up to 1 μ. Pores rather wide; tubes 17 mm. long; veil distinct strongly developed, marginal; stipe solid and reddish with brown streaks; scales of pileus smaller than in *B. ananas* and *B. ananaeceps*, color of pileus, according to original painting, reddish brown; stipe bulbous below.

The type, as described above is no. 685 from Brisbane, Australia, and appears to be quite different from both *B. ananas* and *B. ananaeceps*. The combination **Boletellus rufescens** (Cooke & Mass.) Sing. comb. nov. is herewith proposed.

Boletus squamatus Berk., Hook. J. Bot. **4**: 137. 1852.

Spores 13—17,5 ⇌ 9—10 μ, with transversely striate longitudinal wings, projecting 1.3 μ hyphae without clamp connections.

The type from India belongs undoubtedly in the section *Ananae* Sing. of the genus *Boletellus* as anticipated by me (Farlowia **2**: 128. 1945) on the basis of Hooker's original painting as preserved at the Farlow Herbarium. The spores are relatively shorter than in other species of this group, and justify specific autonomy. The combination **Boletellus squamatus** (Berk.) Sing. comb. nov. is proposed.

Boletus verrucarius Berk.

Spores 21—23 ⇌ 10.3 μ, with longitudinal wings which project 1.3—1.5 μ and show a transverse fine striation (ornamentation of spores as in *B. ananas*). Pores rather wide, tubes very long; pileus surface ornamented as in *B. ananas*, but chestnut color.

The type from Sikkim, India (K) is therefore a representative of the section *Ananae* of *Bolletus*. This species is very closely related with *B. porphyrius*, but has slightly larger spores, and some other characters of its own. The combination **Boletellus verrucarius** (Berk.) Sing. comb. nov. is proposed for it.

Russulaceae.

Russula Pers. ex S. F. Gray.

Russula aeruginosa Mass., Kew Bull. for 1914, p. 73, 1914.

The type from Singapore (K) is pressed flat and heavily impregnated with mercury, and its preparation for microchemical study, or even for the examination of the structure of the various organs is rather difficult. On the other hand, the characters available are rather characteristic. The epicutis seems to consist of hyphous elements exclusively and these seem to form a cutis (but it is possible that there was originally a trichodermial layer, later depressed); dermatopseudocystidia none; spores hyaline, 6.7—7.3 ⇌ 6 μ, with the ornamentation projecting 0.3—0.5 μ.

Since this species is apparently different from other known tropical species, but homonymous with *R. aeruginosa* Krombh., Naturg. Abb. **9**: 13. 1845, the now name **Russula singaporensis** Sing. nom. nov. is proposed.

Tricholoma immaculata Beeli.

The type from the Belgican Congo (K-fragment) was pointed out to me, as being a russulaceous species, by Dr. D e n n i s. It is indeed a *Russula* of the group *R. hoehnelii, R. fragilissima,* etc., closest to the latter but according to the descriptive data given by Beeli, apparently different. Spores 8—10 ⇌ 7—8 μ, ornamentation projecting 0.7 μ, of type III a, III b, II, VIII (in order of decreasing occurrence), hyaline; basidia clavate, 4-spored, relatively long (e. gr. 40 μ), 9.3—13.3 μ broad; sterigmata relatively straight and long, 10—10.7 μ; cystidia of two types, (1) gloeocystidia, with oily contents, bluing deeply in cresyl blue mounts, ventricose, e. gr. 60 ⇌ 8.7 μ, but also longer and shorter; (2) other type of pseudocystidia (macrocystidia? — SV reaction unknown), not bluing in cresyl blue mounts, with banded contents, versiform; cheilocystidia scattered, "empty", broadly rounded above; hymenophoral trama regular-intermixed, with rather numerous spherocysts, but also with even more numerous hyphal cells; oleiferous hyphae numerous, 8 μ broad; epicutis — a trichodermium of hyphous and cystidioid elements, the latter often clavate or ampullaceous-ventricose, 27 ⇌ 6.7 μ, slightly thick-walled and opalescent; hypodermium — a cutis; all hyphae without clamp connections.

The new combination **Russula immaculata** (Beeli) Dennis is proposed.

Russula purpureanigra (sic) Petch, Ann. R. Bot. G. Perad. **6** (3) : 200. 1917.

Spores 7 ⇌ 5.8 μ, ornamentation 0.3—0.4 μ high, of type II, III b. Margin of pileus acute; lamellae crowded.

The type (K) shows that this is a good species of section *Compactae* subsection *Nigricantes,* close to but apparently different from *R. densifolia.*

Russula grossa Berk.

The spores resemble those of *R. melliolens,* but with the uncertainty caused by the lack of so many essential characters in the original description, the species must be considered as incompletely known at least until topotypical material becomes available.

Russula armeniaca Cooke, Handb. p. 336. 1890 (sec. ed.).

Spores about 10.5 μ long, with an ornamentation projecting 0.7 μ, spinulose, of type VI, IV; hyphae of the cuticle projecting into the epicutis and intermixed with numerous primordial hyphae; dermatopseudocystidia absent in the cuticle of the pileus. Appearance of *Russula lutea.*

The type from Epping, England, Aug. 1888 (K) appears much redder now the pictures suggest. Nevertheless, there can be no doubt about the identity of this species. It is, as suggested by me before, the reddish tinted form of *R. lutea*: F. *luteorosella* Britz. Those who consider this a separate species are entitled to use Cooke's binomial.

Lactarius (D. C. ex) S. F. Gray.

Panus reticulatus Berk.

Spores 9.8—10 ⇌ 9.2—9.8 μ, often 9.8 ⇌ 9.8 μ, subglobose and subisotopic as *R. puiggarii,* but somewhat asymmetrical, with a strong amyloid ornamentation of type III a to II—III b, with distant but not very thin anastomoses, 1.5—1.6 μ high. Pileus surface formed by a palisade of brown dermatocystidia with thick wall mostly clavate, but sometimes with subacute apex or with nodulose apex, e. gr. 30—31 ⇌ 5.8—6 μ, macroscopically with a fine reticulation as in many species of *Pluteus.* Context with numerous laticiferous vessels, hyaline, some brownish, and 9—14.5 μ in diameter. Structure of hymenium now not well visible since most basidia and cystidia are destroyed or badly collapsed. This has the habit of a smaller representative of the *Subdulcis*-group, and grew on a log. No veil and not much basal mycelial tomentum visible.

The type, Spruce no. 130, from Brazil (K) is undoubtedly a *Lactarius.* It seems to be close to *Lactarius adhaerens* Heim but lacks the abundant basal mycelium. The combination **Lactarius reticulatus** (Berk.) Sing. comb. nov. is proposed.

Agaricus mitraeformis Berk., Hook. Lond. J. Bot. **3**: 186. 1844.

Spores 12.3—19.3 ⇌ 8—12 μ, with germ pore varying from distinct but not truncate or slightly truncate to indistinct (rarely), both in size and color of two types (smaller and larger, very pale melleous and melleous), all smooth, broadly ellipsoid to narrowly ellipsoid and sometimes slightly fusoid or cylindrical, in general rather variable; well preserved basidia not recovered. Carpophores variable in size, the largest with relatively moderately elongated pileus.

The type from Devil's Mount, South Africa (K) has already been revised by R. Heim, and our data coincide with his in every detail.

The smaller carpophores of this collection are very similar to the type of *Bolbitius liberatus* Kalchbr. = *Cyttarophyllum liberatum* (Kalchbr.) Sing. where the spores are more distinctly pored and often truncate, and cheilocystidia could be demonstrated in the type. The larger carpophores are very similar to a species determined as *B. mitraeformis* by Berkeley but apparently different, collected in the high Andes in Perú, with basically gastroid spores, with indistinct germ pore and consequently close to the other South American species, *Galeropsis allosperma* Sing. from Patagonia which, however, has larger and more constantly pore-less spores. The Peruvian plant is certainly a new *Galeropsis* (Febr. 1864, at Punas, Andes, 10.000 to 14.000 ft, coll. Pearee, K). Another specimen, also considered as conspecific with *B. mitraeformis* by Berkeley, was collected by J. E. T. Aitchison Oct. 1885 in Afganistan (K). This is identical with material recently received by the author from the same country and with the material from Central Asia and the Caucasus described by Lebedewa (as *Psammomyces plantaginiformis*) and commented on by me (Beih. Bot. Centralbl. B, **56**: 148. 1936). Basidia and spores are here more typically gastroid but with distinct germ pore, and no distinct cheilocystidia are encountered.

Conocybe besseyi var. madagascariensis (Pat.) Heim.

Spores about 12—15 ⇌ 7—11 μ, ochraceous melleous in NH_4OH, rusty melleous in KOH, not very deeply colored, with broad, often oblique, more or less truncate germ pore, smooth; basidia with conical, erect or oblique but never half-sickle-shaped sterigmata, more of the gastromycetoid type, (2—)4-spored; some ventricose bodies with central constriction were seen, but seem to be aborted basidioles rather than cheilocystidia. Pileus consistently rather broadly rounded above.

The type (PC) does not seem to be conspecific with the American type where I was able to demonstrate distinct cheilocystidia, in spite of the similarities of habit and spore characters. It also shows more

typical agaricoid basidia than the variety *madagascariensis* and should be separated from the latter.

This opens up a question of fundamental importance: Is the American type generically different from the Madagascar specimens? Knowing only the species enumerated in Lilloa **22** (Agaricales in modern Taxonomy, p. 481) and the species from Central Asia determined by me as *Galeropsis desertorum* (ibidem p. 733) and South America (*Galeropsis allospermum* (Speg.) Sing., see Lilloa **23**: 239. 1950), I would have answered this question affirmatively. However, considering the data given under *Agaricus mitraeformis* Berk. above, it appears that in the case of *Galeropsis* we have the first example of a genus where gastroid forms gradually approach the agarics in the narrower sense in such a degree that it would be possible to insert some of the representatives of the genus, particularly such as *Galeropsis cucullata* (Shope & Seaver) Sing., in the Agaricales, were it not known that other species, not separated from *G. cucullata* by anything like a generic hiatus, are as gastroid and typically secotiaceous as for example *G. desertorum* sensu Sing. (i. e. *Galeropsis plantaginiformis* (Lebedewa) Sing.). Moreover, even if, in the end, a sharper distinction between the more agaricoid and the more gastroid species of the genus *Galeropsis* could be worked out — and I cannot fully exclude this possibility since the presence or absence of cheilocystidia may be a sharper character than can now be appreciated while data on this character are still missing in the descriptions available for at least three species —, the genus *Cyttarophyllum* can never be used for the agaricoid group as had been proposed by me until recently, since the type studies on Heim's material show clearly enough that *Cyttarophyllum* (Heim) Sing. is merely a synonym of *Galeropsis* Vel. & Dvořak, while *Psammomyces* Lebedewa is another. In view of the doubtful separability of the agaricoid group, typified not by *Conocybe besseyi* (Peck) Heim sensu H e i m, i. e. by the description of *C. besseyi* (Peck) Heim in C. R. Acad. Fr., **192**: 291. 1931 which is var. *madagascariensis,* but by *Bolbitius cucullatus* Shope & Seaver, I refrain from proposing any new generic name for *Cyttarophyllum* (Heim) Sing. sensu S i n g e r 1951.

G a l e r o p s i s d e s e r t o r u m Vel. & Dvořak.

The type of this species (PR), kindly lent to the author by Dr. A. P i l á t, was available only in small fragments. The spores are at first ellipsoid without germ pore; later they develop a callus, i. e. a more or less papilliform apex which differs from the remainder of the spore wall in more hyaline character although both the continuation of the episporium and that of the endosporium are discernible; in a further development of the spores, not reached by all apparently mature spores of the specimen, a typically truncate but often not truly apical (rather located as much on the outer side of the spores as the

hilar appendage points to the inner side) germ pore is formed where all layers of the spore wall merge into one colorless layer; size of spores 12.7—15 ⇌ 7.3—9.3 μ (from rare 2-spored basidia: 18—19.3 ⇌ 9.3 μ); basidia well preserved, short-clavate, more rarely short-ventricose, with (2—4) apical sterigmata which are typically (with a single exception seen) gastroid in shape, straight or curved, and in the latter case equal (not half-sickle-shaped), obtuse or acute; wall of basidia hyaline to pale brownish, measurements: 16.8—24 ⇌ 10.7—12.7 μ; cheilocystidia none seen at the edge of the lamellae. The spores, when mature, have the color of *Agrocybe*-spores, not more rusty, and somewhat in the middle between the color of the palest and the deeper pigmented type in *Agaricus mitraeformis* (see above).

G. desertorum is, consequently, a representative of the more gastroid species of the genus as which it had also been interpreted by the author in his previous papers treating the genus. This can now be stated with more certainty than by the mere comparison of the original description and illustration since the data given above are taken from the type of the type species of the genus. Dr. P i l á t kindly writes me that the species was not found since 1930.

My impression is that *G. desertorum* is probably closest to the African representatives of the genus; it is certainly not identical with *G. plantaginiformis* (see below).

P s a m m o m y c e s p l a n t a g i n i f o r m i s Lebedewa.

This species was originally described from the Terek region (Northern Caucasus, LE), but identical material from Central Asia was at the same time examined by me, see Beih. Botan. Centralbl. B, **56**: 147-149. 1936. Since later studies on *Galeropsis* showed the presence of different spore colors, of heteromorphous and homomorphous edges according to the species, it was most desirable to examine more material from the same general region in order to determine whether *P. plantaginiformis* is constantly devoid of cheilocystidia, constantly rust-spored, and consistently showing basidia of a gastroid type. This was important inasmuch as only few basidia are preserved in the original material, and the spore color might be suspected of being dependent on the age of the spores, while cheilocystidia are often collapsed and easy to overlook. Additional material was subsequently discovered in Berkeley's herbarium (K, see under *A. mitraeformis*, above) and was also sent to the author from a collection of fungi (W) made by Gilli in Afganistan. Both collections show the following characters: Spores sometimes extremely variable in size and shape, viz. (1) small (10—11 ⇌ 6—6.5 μ); (2) medium broad (11—12 ⇌ 8.2—9 μ); (3) large and narrow (15—16.5 ⇌ 7.2—7.8 μ); (4) large and broad, the most numerous spore type in all collections, 14—16.5 ⇌ 7.8—10 μ; (5) gigantic spores (exceptional): 18 ⇌ 12.8 μ, 19.3 ⇌ 9.2 μ; 20 ⇌ 10 μ, etc. Color: deep chestnut ferrugineous in KOH, somewhat

less rusty in NH_4OH, melleous ochraceous in detergent solution. The germ pore is present and truncate, very rarely some spores without a truncate pore. Basidia were plentiful in some carpophores; they are broadly cylindrical to ventricose below and somewhat narrowed to the rounded apex, 14.3—22.8 ⇌ 8.5—10.8 μ, with two, more rarely with 4, very rarely with 3 sterigmata, hyaline; conical-spine-shaped and symmetrical (i. e. not half-sickle-shaped), or cylindrical to filamentous and equal and flexuous with rounded tips not ascending from an oblique (toward the apex) to a vertical position, most frequently about 4.2 μ long, but also shorter or much longer; hyphae of the hymenophoral trama hyaline to pale brownish, some pigment-incrusted, thin- to moderately thick-walled, all with clamp connections; epicuticular layer of the pileus (peridium) consisting of shortened and broadened hyphae which at places are denser and more parenchyma-like, the cells either hyaline or brownish, 14—22 ⇌ 10—15.7 μ, seemingly forming a layer like the corresponding one in *Conocybe*, but definitely not hymeniform or palisadic. Trama of the tramal plates regular, consisting of mostly narrow hyphae which are little interwoven; surface of the stipe in its columella-portion without any dermatocystidia and without any differentiation in the outermost layer, all parallel and longitudinally arranged, with thin to slightly thickened walls, hyaline to slightly brownish at places; lower portion of stipe with the same structure; cheilocystidia and cystidia none; dermatocystidia on pileus none.

This analysis shows that the data obtained from my original study in 1936 are identical with those found in the additional material. *G. plantaginiformis* (Lebedewa) Sing. differs from *G. desertorum* Velen. & Dvořák not only in the smaller spores (this difference is likely to be due to the larger number of two-spored basidia in the former) but also in the much deeper and brighter color of mature spores in KOH.

We have, therefore, the following well defined species in the combined genus *Galeropsis (Secotiaceae)*, proceding from the more gastroid to the more agaricoid species:

1. *G. allosperma* Sing. (*Galera paradoxa* Speg. non Matt.) from the xerophytic region of Patagonia (Rio Chubut), characterized by the absence of a germ pore.

2. *G. plantaginiformis* (Lebedewa) Sing. from Afganistan (2 collections), Turkmenistan, and northern Caucasus (type), characterized by germ pore, and deep colored spores in KOH.

3. *Galeropsis* spec. from the Peruvian Andes, with spores of the color of *Agrocybe*-spores, 16—17 ⇌ 9.7—11 μ, rather symmetrical and relatively broad with incomplete germ pore.

4. *G. madagascariensis* (Pat.) from Madagascar, characterized by broader obtuse pileus, cf. no. 7.

5. *G. mitraeformis* (Berk.) Heim from South Africa.

6. *G. liberata* (Kalchbrenner) Heim, also from South Africa.

7. *G. paradoxa* (Mattirolo) Heim from Abyssinia. This may be identical with no. 4.

8. *G. desertorum* Velen. et Dvořak from Czechoslovakia.

9. *G. besseyi* (Peck) Heim, from New-Mexico, North America, characterized by rounded apex of pileus.

10. *G. angusticeps* (Peck), from California, possibly a variety of the former, with more acute pileus.

11. *G. polytrichoides* (Zeller) Zeller, also from California, characterized by the presence of distinct cheilocystidia; spores only melleous and relatively narrow; all basidia 4-spored.

12. *G. cucullata* (Shope & Seaver) Sing., from Wyoming to the Pacific Coast of North America, characterized by the deep colored. rusty spores (as in *G. plantaginiformis)*, and long cheilocystidia.

New and noteworthy discomycetous fungi on coniferous hosts from Switzerland.

By J. Gremmen.
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With one text-figure.

During a visit to Graubünden in Switzerland in June 1954 some interesting discomycetous fungi were found on conifers.

The first is a brown-excipled *Dasyscypha* species occurring on branches of *Pinus montana* Mill.; the second one is a new species of the genus *Durandiella* Seaver, also inhabiting *P. montana* for which the name *Durandiella helvetica Gremmen* n. sp. is proposed. The third fungus is a very characteristic saprophytic organism living on twigs of *Picea Abies* (L.) Karst., on which much confusion seems to exist concerning spore-measurements and hostplants.

1. *Dasyscypha fuscosanguinea* Rehm, Ber. Nat. Ver. Augsb. **26**: 30. 1881 non *Lachnella pini* Brunch., Bergens Mus. Aarsbog **8**: 8—11, 1892.

In the alps around Arosa (Graubünden) near Maran, at an altitude of 1800—2000 meters, many trees of *Pinus montana* were observed, showing dead branches, on which numerous apothecia of the fungus had developed. An attack by this Discomycete was strongly suggested, but was not evidenced. Apothecia also were sampled on young *P. montana,* which had been heavily infested by a „snow-fungus", probably *Herpotrichia nigra,* during last winter, but this could not be confirmed with certainty.

Description of the fungus (Gremmen 748).

Apothecia about 2 mm in diameter, growing in groups and shortly stipitate, about 0.5 mm. The hymenium is orange-red coloured and is surrounded by lightbrown hairs. The asci measure 87—91 ⇌ 10.5 μ and the porus is J —. The ascospores are (12)—13.3—15.2—(16.1) ⇌ 4.7—5.7 μ, one-celled, one-seriate, colourless, ellipsoid or piriform. The paraphyses are filiform, 2.0 μ in thickness, the apex about 3 μ and are filled with orange-yellow globular corpuscles. The hairs are brown, rough and septate, measuring about 136 ⇌ 4 μ.

On branches of *Pinus montana* Mill., Maran, June 3, 1954.

This material was compared with a collection obtained from Dr. I. Jørstad, that was found in Fyresdal in Telemark, Norway 23. IX. 1927, on *P. sylvestris,* leg. I. Jørstad. This specimen of *D. fuscosanguinea* has longer ascospores, ranging from 15.2—19.0 ⇌ 4.7—5.7 μ,

but further was identical macroscopically. The same was true with a specimen of the fungus received from Prof. Dr. V. Kujala. This collection is from Sodankyla Komensis, Finnland, 26. VIII. 1947, on *P. sylvestris,* leg. V. Kujala. Here, too the ascospores were longer. Both norwegian and finnish collections proved to be identical.

Brunchorst (1893) was the first author, who recognized the parasitic nature of a brown-excipled *Dasyscypha* in Norway, where it especially occurred in Finnmark. He described it as *Lachnella pini* n. sp.

According to Lagerberg (1912) *D. fuscosanguinea* is generally spread in the northern part of Sweden, where it is a characteristic element.

Jørstad (1925, p. 42) states that the trunks and also partly the branches are attacked by *D. fuscosanguinea* and subsequently the tops are dying above the place of parasitical invasion. Under certain circumstances, he informs, the fungus may be a saprophyte too.

Afterwards, Kujala (1950) has confirmed this and records (p. 26): „Kangas (1927, pp. 98—99, 146—147) hat den Pilz als wichtigen Schädling der Kiefernkulturen in Nordfinnland gefunden —" and further (p. 27): „Bei Immeljärvi z. B. hatte der Pilz den noch nicht meterhohen Kiefernnachwuchs arg beschädigt, —". Kujala terms *D. fuscosanguinea* a real parasite, especially on young plants, whereas on the thicker branches cankers may be formed too, in which the characteristic apothecia are developed.

Hahn & Ayers (1934) in an excellent paper on some brown-excipled *Dasyscyphae,* demonstrate that there are some differences between the alpine *D. fuscosanguinea* and the arctic *D. fuscosanguinea.*

The arctic species, named by them *Dasyscypha pini,* is based on the Brunchorst specimen and has ascospores distinct from the real *D. fuscosanguinea.* The above mentioned collections (Jørstad, Kujala) were checked and without any doubt they belong to *D. pini,* whereas Hahn & Ayers already proved the same for Lagerberg's fungus.

For Switzerland there exists a small note an the occurrence of *Lachnella pini* Brunch. (Rahm, 1951). This author writes: „An lebender Legföhre". The swiss collection (Gremmen 748) proved to be the real *D. fuscosanguinea* Rehm and as far as is known it is the first record for that country, while certainly *Lachnella pini* Brunch. was a misidentification.

Rehm (1896) described the species from Tyrol (Austria), where it was found by him and his co-workers on *Pinus* species in the mountains.

According to Hahn & Ayers (1934) the arctic species, *Dasyscypha pini* (Brunch.) nov. comb. is associated with destructive can-

kers on *P. Strobus, P. monticola* and *P. albicaulis* and they call *D. fuscosanguinea* an innocuous saprophyte, although the latter one does not occur in North America, but seems to be restricted to Central Europe.

There was some suggestion that *D. fuscosanguinea* parasitized the branches of *P. montana* in the Arosa alps, but this must be carefully investigated.

2. **Durandiella helvetica** Gremmen nov. spec.

On the same trees of *Pinus montana* light brown tops of shoots were noticed. These had been killed and all needles had been dropped. Here upon a search was made for the apothecia of *Scleroderris abietina* (Lgbg.) Gremmen, since this fungus was thought to be the real cause of the death. These fructifications, however, could not be

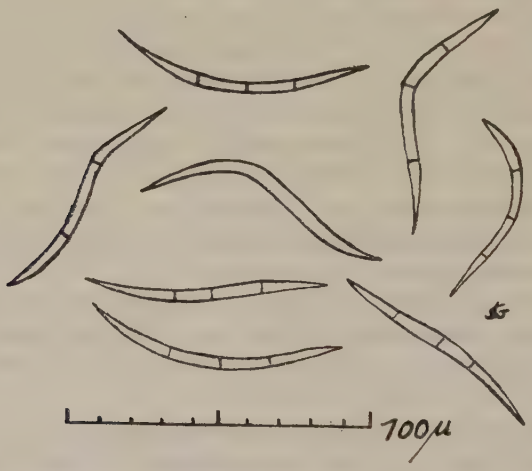

Fig. 1. *Durandiella helvetica* Gremmen n. sp.: ascospores.

detected, but instead of this species, a very few apothecia of an unknown Discomycete were found. Since it was not possible for me to find a description of this typical fungus in literature, it is described here as a new one.

At present, it is impossible to say whether this fungus has killed the shoots or not, since this was not investigated.

Apotheciis erumpentibus, solitariis, sessilibus, 1 mm in diam., atris; hymenio atro-viridi; hypothecio hyalino, plectenchymatico; excipulo atro-brunneo; ascis 144—160(170) ⇌ 11—12(15) µ, poro iodo ope non coerulescente; ascosporis (65)—76—84(88) ⇌ 3—4 µ, hyalinis, elongatis, filiformibus, undulatis, continuis vel 3-septatis; paraphysibus hyalinis, filiformibus ad apicem leviter incrassatis agglutinatisque, epithecium fuscum formantibus.

Hab. ad ramis emortuis Pini montanae, prope Maran versus Arosa, Helvetia, 3. VI. 1954, leg. J. Gremmen.

Apothecia erumpent, separated, sessile, roundish, about 1 mm in diameter, black when dry. Hymenium olive-green, when mature surrounded by 3 till 4 fragments of the excipulum, about 150 μ in thickness. Hypothecium 60—75 μ thick in the centre, consisting of hyaline, interwoven hyphae. Excipulum darkbrown, 70—90 μ thick, the upper part rupturing, when the apothecium becomes mature, so that the disc is liberated. Asci 144—160(170) ⇌ 11—12(15) μ, porus J —. Ascospores (65)76—84(88) ⇌ 3—4 μ, hyaline, elongated, filiform, with pointed ends, undulate, sickle-shaped or sigmoid, one-to four-celled, intertwined in the ascus. Paraphyses hyaline, filiform, tips swollen till about 4 μ, brownish, rough, forming a characteristic brown epithecium.

When this fungus was investigated, the writer was inclined to refer it to *Godronia pineti* Jørst., a Discomycete occurring on *Larix sibirica* and on *Pinus* in Norway (Jørstad, 1925, pp. 129—130).

Through the kindness of Dr. I. Jørstad it was possible for me to study part of the type. It appeared, however, that *Godronia pineti* was quite distinct from this Discomycete, since the ascospores of the first are principally straight, needle - shaped, not - intertwined in the ascus, hyaline or sometimes light yellowish coloured and furnished with a great number of septae (according to Jørstad 30—35 septatae).

The ascospores of my collection, however, are always curved, intertwined in the ascus, colourless, primarily continous, but afterwards becoming 3-septate.

With the recent monograph on the genus *Durandiella* Seaver (Groves, 1954), in which genus this fungus should be placed, it was not possible to identify the species. The spore-measurements were quite distinct from any one described by Groves and to quote him: „Both the size of the asci and ascospores are important characters in distinguishing species". We may further note that up till now conifers have never been recorded as hostplants of *Durandiella* species.

It seems also fully justified, after a critical study of literature, to erect a new member of this genus and the name *Durandiella helvetica* n. sp. is therefore proposed.

Since the genus has a predominantly north-american significance, it is very important to detect a new european member.

There is but one small collection, which is deposited in the authors herbarium with number 751, whereas photo-micrographs of the fungus have been forwarded to the Naturhistorisches Museum at Wien, the Kew Herbarium, The Herbarium of the Plant Pathological Department at Ottawa and to the Herbarium of the Plant Pathological Department of Cornell University at Ithaca.

On the same twigs apothecia of the Discomycete *Cenangium ferruginosum* Fr. were observed. This fungus is a very common one on dead branches of different *Pinus* species. Its biology has been investigated (Gremmen, 1952) and its saprophytical nature (Van Vloten & Gremmen, 1953) be settled.

3. *Tryblidiopsis pinastri* (Pers.) Karst., Myc. Fenn. **1**. 262. 1871.

This fungus is a very common one in that part of the canton Graubünden, where it prefers inhabiting dead branches of *Picea Abies* (L.) Karst., with numerous apothecia. Nothing is known of a possibly parasitic nature, but instead of this its saprophytical character seems to be well established.

Description of the fungus (Gremmen 752). Apothecia about 1 mm in diameter, black when closed, horny, growing in groups, short stipitate; when mature the upper part of the excipulum stellately ruptures with 5—7 fragments, surrounding the disc. Hymenium milky-coloured, yellowish to lightbrown or greyish. The asci measure 155—179 ⇌ 19—20 μ, especially the upper part is very thick, J—. Ascospores 38—42 ⇌ 11.4 μ (measurements without the adhering slime mass), one-celled, when immature, but two-celled when ripen, surrounded by a thick layer of mucus, varying from 5—6 μ in thickness. Paraphyses filiform, colourless, about 4 μ thick, septate.

On dead branches of *Picea Abies* (L.) Karst., Litzirüti, near Arosa (Gremmen 752), June 12, 1954; environs of Arosa (Gremmen 755), June 6, 1954.

Statements about the real spore-measurements are very variable in literature.

Rehm (p. 194) found ascospores measuring 18—27 ⇌ 6—7 μ, agreeing well with the spores observed in young apothecia of my collections, ranging from 23—27 ⇌ 5.7 μ. Mature spores, however, are much larger as is shown in the above description and therefore I believe that Rehm has measured them in a state too young, what seems to be very obviously, since he informs: „Obgleich sie selten in vollständig reifem Zustande beobachtet wurde, —".

The data on my spore-measurements have been obtained from spores naturally discharged on a glass slide in water and they prove to be considerably larger.

Tryblidiopsis pinastri may be easily confused with *Tympanis* species, the apothecia of which also develop on dead branches of conifers.

Rehm (1896) described the first fungus on dead twigs of *Pinus sylvestris,* which is not in accordance to Kujala (vide infra). The latter author never found this fungus on *Pinus,* but on *Picea, Larix, Abies sibirica* and incidently on *Pseudotsuga* too. This is confirmed by Jørstad (1925, p. 101), who found the organism confined to *Picea Abies* only.

I was not able to find the Discomycete on *Pinus* species, but always found it on *Picea Abies*.

Tympanis pinastri Tul., on the contrary, is a common species on dead twigs of *Pinus* and we may suppose that even Rehm sometimes confused them when studying them macroscopically, since he states: „Eine vielfältig verkannte und besonders mit *Tympanis pinastri* Tul. verwechselte Art".

Acknowledgements.

The writer is very much indebted to Dr. I. Jørstad from the Botanical Museum, Oslo, for a gift of a fragment of the type of *Godronia pineti* Jørst., besides part of a norwegian collection of *Dasyscypha fuscosanguinea* Rehm; to Prof. Dr. V. Kujala, Forest Research Station, Helsinki, for giving me part of a finnish collection of *Dasyscypha fuscosanguinea* Rehm.

I also wish to express my great thanks to Dr. A. P. Kole, Wageningen, for assistance in preparing photomicrographs of *Durandiella helvetica* and to Miss D. Schans for valuable help in translating parts of danish and norwegian literature.

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Über Cyphella tephroleuca Bres.

Von A. Pilát (National-Museum in Prag, ČSR.).

Schön entwickelte, von Prof. Gauba in Australien gesammelte, mir von Herrn Dr. F. Petrak zugesandte Exemplare von *Cyphella tephroleuca* Bres. veranlassten mich, diese, bei uns nicht gerade seltene, meist aber nur in schlecht entwickeltem oder ganz sterilem Zustande auftretende Art einem speziellen Studium zu unterziehen, über dessen Ergebnisse die folgenden Zeilen berichten sollen.

Cyphella tephroleuca Bres. Fungi Trid. **2**: 57, t. 166 f., 2, 1898. Sacc. Syll. **16**: 201, 1902. — Sacc., Fl. it cr. Hym. p. 1211, 1916. — Bres. Ic. Myc. t. 1082, f. 3, 1932.

Syn.: *C. leochroma* Bres. Fungi Trid. **2**: 99, t. 211, f. 1, 1900. — Sacc. Syll. **16**: 201, 1902. — Grelet, Bull. Soc. Myc. Fr. **30**: 416, t. 31, 1914. — Sacc. Fl. it. cr. Hym. p. 1215, 1916. — Bourd. et Galz. Hym. Fr. p. 160, 695, 1928. — Bres. Ic. Myc. t. 1082, f. 1, 1932.

C. Bresadolae Grelet, Bull. Soc. Myc. Fr. **38**: 174, 1922 — Pilát,Mon. Cyph. Čechosl. in Publ. Fac. Sci. Univ. Charles, Prague 1925, Nr. 29, p. 61. — Pilat in Ann. Myc. **23**: 161, 1925.

C. gregaria Syd. in Hedwigia 1900, p. 16. — Sacc. Syll. **16**: 202, 1902.

C. Bresadolae var. *gregaria* (Syd.) Pilát. Mon. Cyph. Čechosl. in Publ. Fac. Sci. Univ. Charles, Prague, 1925, Nr. 29, p. 62. — Pilát in Ann. Myc. **23**: 162, 1925.

Auf dürren Ästchen von *Daviesia latifolia*. New South Wales, in Wäldern östlich von Gouldburn, 16. II. 1951, leg. E. Gauba.

Frische Fruchtkörper halbkugelig-becherförmig bis breit kegelförmig, 300—800 μ breit, 200—300 μ hoch, vertrocknet zusammengezogen, fast kugelig, 200—300 μ breit und ungefähr ebenso hoch, langhaarig, hell lehmbraun, lehmbraun-rostfarbig bis ziemlich schmutzig braun, im Alter gewöhnlich dunkler gefärbt. Hymenium blass, bei vertrockneten Exemplaren nicht sichtbar, weil der Rand stark zusammengerollt ist. Basidien gross, deutlich keulenförmig, 35—45 ⇌ 8—9 μ, gewöhnlich mit vier 5—5.5 μ langen, etwas gebogenen Sterigmen. Sporen länglich-ellipsoidisch, zum Scheitel manchmal deutlich verjüngt und deshalb etwas spindelförmig, mit deutlichem, etwas excentrischem Apiculus, farblos, glatt, mit körnigem Inhalt, oft mit einigen Öltröpfchen, 11—14 ⇌ 6—7 μ gross. Haare gross und auffällig, zylindrisch, aber etwas knotig, nach oben etwas verjüngt, aber stumpf, fast farblos und mit kleinen Calciumoxalatkörnchen besetzt, weiter unten rostbraun, ziemlich dickwandig, glatt, nicht inkrustiert, 200—300 ⇌ 6—7,5 μ gross.

Die Beschreibung wurde nach den australischen Exemplaren entworfen, die aber völlig mit den europäischen übereinstimmen. Die Art wurde zuerst von Bresadola im Jahre 1898 unter dem Namen *Cyphella tephroleuca* Bres. beschrieben und zwei Jahre später noch einmal unter dem Namen *Cyphella leochroma* Bres. Die Identität beider Arten wurde von Grelet (1922) festgestellt, der diesen Pilz mit dem neuen Namen *Cyphella Besadolae* Grel. bezeichnete. Die zwei Arten Bresadola's führt er als Varietäten dieser Art an. Es handelt sich aber eher um zwei verschiedene Entwicklungsstadien als um Formen von systematischem Wert. Die jungen Exemplare sind gewöhnlich heller gefärbt als die älteren. Die Haare sind grösstenteils einzellig. Alle Exemplare, welche ich untersucht habe, hatten einzellige Haare. Wie Grelet berichtet, kommen auch in der Natur Exemplare mit zum Teil undeutlich septierten Haaren vor. Das war auch die Ursache, warum Bresadola diesen Pilz unter zwei Artennamen beschrieben hat.

Diese *Cyphella*-Art ist in Europa keine Seltenheit, wird aber wegen der winzigen Dimensionen und unauffälligen Farbe oft übersehen. Sie wächst auch an ziemlich trockenen Lokalitäten, wo die Mykologen Pilze gewöhnlich nicht suchen. Sie ist eine typisch plurivore Art. Bresadola sammelte sie bei Trident in Norditalien zuerst auf dürren Ästchen von *Fraxinus ornus* (*Cyphella tephroleuca*) und später auf dürren Ästchen von *Acer campestre* (*Cyphella leochroma*). Später wurde sie von Grelet in Frankreich (Dep. Vienne) auf trockenen Ästen der Weinrebe gefunden. Bourdot und Galzin erwähnen Exemplare, welche M. de Crozals bei Toulon in Frankreich auf abgestorbenen Stengeln von *Scirpus holoschoenus* gesammelt hat.

Ich untersuchte folgende Exemplare aus der Tschechoslowakei: Böhmen: Mnichovice bei Prag, auf *Artemisia cmpestris* 1925, leg. Velenovský. Ibidem auf *Hypericum perforatum*(?) VI. 1926, leg. Velenovský. Ibidem II. 1928, leg. Velenovský. Ibidem auf *Sarothamnus vulgaris* VII. 1929, leg. Velenovský. Radotín bei Prag, auf Ästchen von *Ligustrum vulgare* IX. 1924, leg. Pilát. Ibidem auf Stengeln von *Bupleurum falcatum*, II. 1926, leg. Velenovský. Karlstein bei Prag, auf *Centaurea jacea*, VI. 1946 leg. Vacek. Mähren: Im Tale Řička bei Brünn auf Ästchen von *Coryllus avellana* X. 1942, leg. F. Šmarda.

Weiter untersuchte ich Exemplare, die A. G. Eliasson auf dürren Stengeln von *Humulus lupulus* in Schweden (Halland: par. Onsala, Gottskär, 1.-VI.-1914) sammelte. Im Herbar des Naturhistorischen Museums in Wien befinden sich Exemplare aus Deutschland, die Sydow unter dem Namen *Cyphella gregaria* Syd. beschrieb. Es handelt sich um junge, schlecht entwickelte und sterile Frucht-

körper. Die meisten europäischen Kollektionen, die ich untersuchte, sind steril. Die Fruchtkörper enthalten oft nur unentwickelte oder fremde Sporen. Die Sporenangaben, die ich in meinen Arbeiten aus dem Jahre 1925 bei *Cyphella Bresadolae* Grel. und *C. Bresadolae* var. gregaria (Syd.) Pilát anführe, sind unrichtig.

Gut entwickelte Basidien sind immer auffällig gross, gewöhnlich 45 ⇌ 9 μ. *Cyphella tephroleuca* Bres. ist eine Art, die besonders für die trockenen Laubwälder und Gebüsche charakteristisch ist. Die Fruchtkörper entwickeln sich bei nasser Witterung, dann vertrocknen sie, halten sich lange, sind aber dann meist steril. Diese Art kommt wahrscheinlich in den gemässigten und subtropischen Zonen der beiden Halbkugeln vor.

Hosts of Synchytrium australe Speg.

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Synchytrium is the largest of the chytrid genera and includes at present more than 150 reported species, all of which are parasites of algae, mosses, ferns and flowering plants. Ever since the genus was established by De Bary and Woronin in 1863 most investigators have had a tendency to create new species for each host infected in nature. This has been particularly evident in the last decade during which more than 50 new species have been created primarily on this basis. This tendency is further reflected in the literature reports that of all known species, 114 have been recorded on only one host. As the author (1954 A) pointed out previously only eight species have been studied to determine their host range and host specificity, and of these only four have been investigated intensively. Since host, host range, and host specificity have been used as criteria for identification and classification it is obvious that intensive studies along these lines are essential for all species of *Synchytrium* which appear to be morphologically similar and occur on the same or different hosts. The author's (1954 D) host range study of *S. aecidioides* indicates how significant such investigations may be in relation to species which have been reported on several different hosts.

The present study concerns the host range of *Synchytrium australe* which Spegazzini (1881) and Cook (1945) reported as a parasite of *Modiola caroliniana (M. prostrata)* in Argentina and Louisiana, respectively. Cook described it as a new species, *S. modioliensis,* but the author (1954 C) believes that Cook's species is identical to *S. australe.* This species and its host were collected at Baton Rouge, La. by the author in March, 1953 and 1954, and transferred to the greenhouses at Purdue University where both have flourished remarkably well. During the spring and summer of these years, plants and seeds of various wild and cultivated malvaceous

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species were collected and grown in the greenhouses for use in determining the host range and host specificity of *S. australe.*

In making these cross inoculations it was soon found that a healthy and viable inoculum of sporangia and zoospores had to be maintained constantly. This was accomplished by periodically inoculating cotyledons and the first leaves of seedlings of *Modiola caroliniana, Althaea rosea, Hibiscus esculentus* and *Malva rotundifolia* which are highly susceptible. This insured a constant and fresh supply of inoculum. The technique and procedure employed in testing the susceptibility of various plants were tested first on *M. caroliniana* to determine their effectiveness. If infection occurred on this host the methods were assumed to be effective. As a further check the inoculum was examined microscopically to insure the presence of healthy sporangia and their ability to produce viable zoospores. As far as was possible emerging leaves of mature plants as well as cotyledons and first leaves of seedlings were inoculated for each species tested. As soon as the leaves emerged they were wetted thoroughly, and a heavily infected piece of leaf with healthy sporangia was inserted between them. The leaves and the inoculum were swathed in a tuft of water-absorbent cotton, and the plants were then covered with a bell jar to maintain a moist environment. Care was taken to prevent the leaves and inoculum from becoming water-logged. After the first week examinations were made every two days over a period of several weeks to determine whether or not infection and gall development had occurred. In doubtful cases the inoculated leaves were removed and examined under the low power stereoscopic microscope. Also, free hand sections were made and studied as an adjunct to the macroscopic examinations.

The results of these inoculations are shown in table 1 which relates to inoculated emerging leaves of grown plants, and cotyledons and first leaves of seedlings.

It is to be noted in table 1 that the results of inoculating emerging leaves of grown plants are negative except for *Althaea rosea, Hibiscus esculentus, Malva rotundifolia, Modiola caroliniana, Gossypium herbaceum, G. arboreum, Impatiens sultana, Circaea latifolia* and *Oenothera biennis* var. *Winslow.* In the last five species named, however, only a few aborted galls were found. Infection of cotyledons and the first leaves of seedlings, on the other hand, was common and abundant. As shown in the second column of table 1 seedlings of 10 species in 6 genera of the Malvaceae besides *Modiola caroliniana* were infected. These results confirm the common observations of investigators in the field that infection by *Synchytrium* occurs usually at the seedling stage of the respective hosts.

Only three non-malvaceous species, *Circaea latifolia, Impatiens sultana* and *Oenothera biennis* var. *Winslow* were infected, but the few

galls present had aborted in the early stages of development. On *Oenothera biennis* var. *Winslow* the infections occurred primarily at the base of the trichomes, and the resulting galls were greatly elongate, conical or columnar in shape. Apparently, these non-malvaceous species are weakly susceptible to infection but resistant to the development of the parasite. In the family Malvaceae, *Modiola caroliniana, Hibiscus esculentus, Althaea rosea, A. officinalis,* and *Malva rotundifolia* were the most susceptible to infection and development of the parasite under the conditions of these experiments, but on some seedlings of *A. rosea* and *H. esculentus* as high as 20 and 8 per cent, respectively, of the galls and parasites aborted, as was noted previously by the author (1954 B). Accordingly, these two species appear to be highly susceptible to infection but more resistant to the development of the parasite. *Gossypium herbaceum, G. arboreum, Hibiscus syriacus* and *Thespesia populnea,* on the other hand, appear to be weakly susceptible to infection and also resistant to the development of the parasites. All tested species of *Sida* except *S. carpinifolia* were resistant both in the seedling and mature stages under the conditions of these experiments, but later *S. cordifolia* was found to be weakly susceptible under flooded conditions.

Particularly significant was the lack of infection of *Callirrhoe involucrata* because *S. australe* was reported and collected on this host by Jennings (1890) and Bartholomew (1902, 1927) in Texas and Kansas, respectively, according to herbarium specimens distributed by them. The author has examined their specimens, and these appear to be morphologically similar to *S. australe* on *Modiola caroliniana.* In light of the results obtained in the above inoculations it seems quite possible that biological races of *S. australe* exist in nature, and that the one on *Modiola* will not infect *C. involucrata.* On the other hand, they might prove to be distinct species. The author has searched for the species on the latter host in Texas where Jennings collected it but has not yet found it.

Whether or not susceptibility and resistance of these various hosts to infection is associated with differences in karyotype and chromosome number is not certain. As Skovsted (1935) has shown the basic number of chromosomes vary in *Abutelon, Althaea, Malva, Callirrhoe, Sida, Urena, Hibiscus, Thespesia* and *Gossypium,* and in only 15 of the malvaceous hosts used by the author are the chromosome numbers known.

The leaves of many of the malvaceous species used in these tests are covered with numerous trichomes and because of this it is difficult ordinarily to moisten or wet the surface of the leaves thoroughly. It was believed that this might have a direct bearing on the lack of infection of some of the hosts. Accordingly, the cotyledons and

leaves of seedlings and emerging leaves of grown plants were washed with a 0.5% solution of a wetting agent, "Tween 80" and then rinsed with distilled water to remove the detergent. Immediately afterwards they were inoculated in the manner described for the previous experiments. The results obtained were largely negative. The non-susceptible species remained resistant, and only in the case of *H. syriacus, H. trioneum, Gossypium herbaceum* and *H. arboreum* were the aborted galls slightly more numerous than in the previous tests.

Synchytrium australe is difficult to maintain on *Modiola caroliniana* and other highly susceptible hosts in the greenhouse during the hot months of July, August and September by the inoculation methods described above. *Modiola caroliniana* appears to become partially dormant during these months, and it was very difficult to infect the young leaves although the plants were kept in pots in a shallow cement trough or bench whose bottom was occasionally flooded with water. However, it was noted that young leaves on creeping stems which had grown into the flooded bench became heavily infected during the summer. On such leaves apparently *S. australe* maintained itself throughout the hot summer months. When the bench was flooded periodically zoospores, apparently, were discharged from mature sporangia and infected the leaves as they emerged. This observation led to another inoculation experiment involving periodically flooded or submerged seedlings.

Seeds of *Abutelon indicum* (5), *A. graveolens* (5), *Callirrhoe involucrata* (4), *Hibiscus syriacus* (12), *H. trioneum* (18), *Modiola caroliniana* (20), *Sida cordifolia* (43), *S. rhombifolia* (12) and *S. spinosa* (10) were germinated on filter paper in petri dishes. As the cotyledons emerged from the seed coats a heavily infected leaf of *M. caroliniana* was placed in each dish, and it as well as the seedlings were flooded with $^1/_4$' of non-chlorinated tap water. The dishes were allowed to stand in the laboratory 24 hours after which the roots of the seedlings were covered with soil. After two weeks the seedlings were examined carefully under the stereoscopic microscope for infection.

The results were negative except for 18 seedlings of *Modiola caroliniana* and 7 of *Sida cordifolia*. The cotyledons of *M. caroliniana* were heavily infected whereas those of *S. cordifolia* had only very few aborted and mature galls. In two cases only one gall was found on each seedling.

This experiment was repeated with approximately the same number of seedlings except that the dishes of seedlings were placed in the greenhouse bench next to heavily infected creeping stems of

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*) The number in parentheses after each species indicates the number of seeds which germinated and were exposed to the inoculum.

Hosts	Emerging Leaves of Mature Plants			Cotyledons and First Leaves of Seedlings		
	No. Plants Inoculated	Results		No. Plants Inoculated	Results	
Malvaceae						
Abutilon theofrastii	12	0	12—	24	6	18—
A. graveolens				2	0	2—
A. indicum				2	0	2—
Althaea officinalis	15	0	15—	100	82	18—
A. rosea	20	16	4—	100	92	8—
Callirrhoe involucrata	8	0	8—	14	0	14—
Gossypium herbaceum	15	Few aborted galls		15	Numerous aborted galls	
G. arboreum	15	Few aborted galls		15	Few aborted galls	
Hibiscus esculentus	15	4	11—	60	40	20—
H. lasiocarpus				12	0	12—
H. militaris	12	0	12—	12	0	12 –
H. moschatus	8	0	8—	8	0	8—
H. palustris	8	0	8—	8	0	8—
H. sabdariffa				5	0	5—
H. syriacus	15	0	15—	30		
H. trioneum	15	0	15—	30	Few aborted galls	
H. aculeatus	10	0	10—		Few aborted galls	
Kosteletzkya virginica				12	0	12—
Malva rotundifolia	10	8	2—	30	30	0—
Sida ascuta				4	0	4—
S. carpinifolia				12	4	8—
S. cordifolia	12	0	12—	12	0	12—
S. hastata	30	0	30—	30	0	30—
S. indica	20	0	20—	20	0	20—
S. rhombifolia	20	0	20—	20	0	20—
S. spinosa	30	0	30—	30	0	30—
Thespesia populnea	4	0	4—	4	Few aborted galls	
Urena lobata				12	0	12—
Amaranthaceae						
Amaranthus retroflexus	4	0	4—			
Balsaminaceae						
Impatiens sultana	4	Few aborted galls				
Bignoniaceae						
Bignonia sp.	4	0	4—			
Chenopodiaceae						
Chenopodium album	5	0	5—			
Euphorbiaceae						
Ricinus communis	5	0	5—	5	0	5—
Geraniaceae						
Geranium carolinianum	12	0	12—	12	0	12—
G. maculatum	12	0	12—	12	0	12—
G. pusillum	12	0	12—	12	0	12—
Labiatae						
Monardia fistulosa	12	0	12—	12	0	12—
Leguminosae						
Amphicarpaea bracteata	12	0	12—	12	0	12—
Crotalaria stricta	12	0	12—	12	0	12—
Pueraria thunbergiana	12	0	12—	12	0	12—
Onagraceae						
Circaea latifolia	6	Few aborted galls				
Oenothera biennis var. Williamsburg	5	0	5—			

Hosts	Emerging Leaves of Mature Plants			Cotyledons and First Leaves of Seedlings		
	No. Plants Inoculated	Results		No. Plants Inoculated	Results	
O. biennis var. Winslow	5	Few aborted galls				
Rosaceae						
Potentilla recta	4	0	4—			
P. canadensis	4	0	4—			
Duchesnia indica				5	0	5—
Salicaceae						
Populus deltoides	3	0	3—			
Solanaceae						
Petunia axillaris	5	0	5—			
Umbelliferae						
Hydrocotyle canbyi	12	0	12—			
H. umbellata	12	0	12—			
Urticaceae						
Urtica dioica	12	0	12—			
U. chamaedryoides	12	0	12—			
Vitaceae						
Parthenocissus quinquefolia	4	0	4—			

Table 1 showing results of inoculating emerging leaves of mature plants and cotyledons and first leaves of seedlings with *Synchytrium australe.*

M. caroliniana. These and the entire bench were flooded to a depth of three inches four times during the course of three weeks. Again, the results were negative except for 8 out of 12 seedlings of *M. caroliniana* and 2 out of 9 seedlings of *S. cordifolia.*

In this connection it may be noted that *Dichondra repens, Duchesnea indica, Lythrum lanceolatum* and *Rubus trivealis* spread from their pots onto the bed of soil among the infected creeping stems of *Modiola caroliniana.* Also, seedlings of *Stellaria media, Cerastium vulgatum, Oxalis repens, Lepidium campestre* and *Linaria vulgaris* grew up in the bed, and these were flooded at the same time so that they had excellent opportunities for infection by zoospores. However, over the course of two years none of them became infected.

It is apparent from these inoculations that *S. australe* from Louisiana will infect a large number of malvaceous species besides *Modiola caroliniana* under greenhouse experimental conditions. However, with the possible exception of *Callirrhoe involucrata* noted above, it has not been reported on any of these additional hosts in nature. It is possible that if such hosts grew in close proximity to heavily infected *M. caroliniana* plants in nature the susceptible ones would become infected. However, of these hosts only *Callirrhoe involucrata* and *Malva rotundifolia* are prostrate and creeping species which grow close to the ground where moisture conditions are most favorable for infection.

Summary.

Synchytrium australe Speg., which occurs as a parasite on *Modiola caroliniana* in nature, was tested on 28 malvaceous and 24 non-malvaceous hosts in greenhouse inoculation experiments. Twelve of the malvaceous species, including *Abutelon theofrastii, Althaea officinalis, A. rosea, Gossypium herbaceum, G. arboreum, Hibiscus esculentus, H. syriacus, H. trioneum, Malva rotundifolia, Sida cordifolia, S. carpinifolia* and *Thespesia populnea,* were infected under these conditions. However, only aborted galls were formed on *Gossypium herbaceum, G. arboreum, Hibiscus syriacus, H. trioneum* and *Thespesia populnea.* Of the nonmalvaceous hosts tested only *Circaea latifolia, Impatiens sultana,* and *Oenothera biennis* var. *Winslow* were infected, but only aborted galls developed on these hosts.

Infections occurred more commonly on cotyledons and the first leaves of seedlings than on emerging leaves of mature plants. Except for *Althaea rosea, Gossypium herbaceum, G. arboreum, Hibisculus esculentus* and *Malva rotundifolia* no infections occurred on emerging leaves of mature plants. Although *Synchytrium australe* will infect a large number of malvaceous species under greenhouse conditions it has not been reported on any of these hosts except *Modiola caroliniana* and *Callirrhoe involucrata* in nature.

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Scharifia n. gen., eine neue Gattung der scolecosporen Sphaeriales.

Von F. Petrak (Wien).

Scharifia Petr. n. gen.

Perithecia laxissime dispersa, primo innata postea plus minusve, interdum fere omnino erumpentia et quasi superficialia, ellipsoidea, longitudinaliter protracta, in latere jacentia, vertice et basi quasi in latere sita, ostiolo crasso, papilliformi vel fere verruciformi perforato praedita, inferne stromate marginali, quasi pedato minutissime fibroso-celluloso, fere opace atro-olivaceo cincta; pariete membranaceo, pseudoparenchymatico, minutissime celluloso, atro-olivaceo, intus imprimis ad ostioli basin amoene rubro-olivaceo, denique hyalino; asci numerosi elongato-cylindracei, breviter stipitati, tenuiter tunicati, 8-spori; sporae filiformes, fere ascorum longitudine, hyalinae, muco hyalino, angusto obvolutae, multiseptatae, in maturitate omnino in loculos breviter cylindraceos, utrinque truncatos dilabentes; paraphyses subnumerosae, filiformes, sero mucosae.

Perithezien zerstreut, ganz eingewachsen, dauernd bedeckt oder hervorbrechend, zuweilen fast ganz frei werdend, in der Längsrichtung des Substrates stark gestreckt, ellipsoidisch, ganz auf der Seite liegend, Scheitel und Basis daher die Enden bildend, ziemlich gross, mit schief aufwärts gerichtetem, dickem, als rundliche Warze oder Papille vorspringendem Ostiolum, am Rande der scheinbaren Basis, besonders am Grunde des Scheitels mit fussförmigem Basalstroma von sehr undeutlich faserig kleinzelligem, fast opak schwarzbraunem, zuweilen auch fast hyphigem Gewebe. Peritheziummembran häutig, von schwarzbraunem, sich innen besonders am Grunde des Ostiolums wein- oder violettrot färbendem, schliesslich hyalin werdendem Gewebe. Aszi zahlreich, lang und dünn zylindrisch, kurz gestielt, ziemlich dünnwandig, 8-sporig. Sporen dünn fädig, fast so lang wie die Aszi, mit schmaler Gallerthülle und sehr vielen Querwänden, an diesen bald in die einzelnen, kurz zylindrischen, beidendig abgestutzten Teilzellen zerfallend. Paraphysen ziemlich spärlich, fädig, spät verschleimend.

Scharifia procumbens Petr. n. spec.

Perithecia laxissime dispersa, primo innata, postea plus minusve, interdum fere omnino erumpentia et quasi superficialia, ellipsoidea, majuscula, longitudinaliter protracta, in latere jacentia, inde vertice

et basi quasi in latere sita, 600—1000 μ longa, 300—500 μ lata, ostiolo crasso, papilliformi vel verruciformi, poro irregulariter rotundato ca. 40 μ lato perforato praedita, inferne stromate marginali, quasi pedato, imprimis sub basi et vertice bene evoluto, minutissime fibroso-celluloso, fere opace atro-olivaceo, subinde fere plectenchymatico-hyphoideo cincta; pariete membranaceo, contextu pseudoparenchymatico, e cellulis 6—10 μ diam. metientibus, extus plus minusve compressis, obscure olivaceis, deinde imprimis ad ostioli basin amoene rubro-violaceis, intimis hyalinis vel subhyalinis paulo minoribus composito; asci numerosi, anguste elongato-cylindracei, breviter stipitati, sat tenuiter tunicati, 8-spori, p. sp. 450—650 ⇌ 9—10.5 μ; sporae filiformes, parallele positae, utrinque obtusiusculae, vix attenuatae, rectae vel paulo curvulae, hyalinae, muco hyalino obvolutae, fere ascorum longitudine, mox omnino in loculos breviter cylindraceos, utrinque truncatos, 3.5—8 μ longos, 2—3 μ latos dilabentes; paraphyses subnumerosae, filiformes, ca. 1.5 μ crassae, sero mucosae.

Perithezien zerstreut, ganz vereinzelt, sehr selten zu 2—3 etwas dichter hintereinander stehend, sich unter mehreren, meist 2—3 Zellschichten der Matrix entwickelnd, bisweilen dauernd bedeckt bleibend, meist jedoch durch Längsrisse hervorbrechend, bisweilen fast ganz frei werdend und scheinbar oberflächlich wachsend, in der Längsrichtung des Substrates gestreckt um 90° gedreht, daher auf der Seite liegend, so dass auf senkrechten Medianschnitten die eine Seite in Wirklichkeit die Basis, die andere der Scheitel des Peritheziums ist, während Basis und Scheitel der Seitenwand des Gehäuses entsprechen. Die Perithezien sind meist 600—800 μ, seltener bis ca. 1000 μ lang, 300—500 μ dick, ellipsoidisch, mit der unteren, fast ganz flachen Seite dem Substrat fest aufgewachsen, oben mehr oder weniger konvex. Der kaum oder nur undeutlich verjüngte Scheitel des Gehäuses ist in der Mitte mit dem plötzlich schief aufwärts gerichteten, ca. 80 μ dicken, als eine kleine, rundliche Warze oder Papille vorspringenden, sich durch einen ca. 40 μ weiten Porus öffnenden, breit, fast gestutzt abgerundeten Ostiolum versehen. An den dem Scheitel und der Basis entsprechenden Enden ist das Gehäuse mit einem bald nur schwach, bald ziemlich kräftig entwickelten, fussförmigen, aus einem fast opak schwarzbraunen, undeutlich faserig-kleinzelligen, sich oft etwas lockernden, dann aus dicht und reich verzweigten, fast opak schwarzgrünen, ca. 2 μ dicken Hyphen bestehenden, mehr oder weniger zahlreiche, krümelige, ganz verschrumpfte Substratreste einschliessenden, ca. 100—250 μ langen, am Gehäuse bis ca. 180 μ dicken, sich nach aussen schnell verjüngenden und oft ziemlich spitz zulaufenden Basalstroma verwachsen. Die Peritheziummembran setzt sich, mit Ausnahme der fest aufgewachsenen Gehäusebasis aus drei Schichten zusammen. Die äusserste bis ca. 60 μ dicke Schicht besteht der Hauptsache nach aus 2—3 schwarzbraun verfärb-

ten Zellschichten des Substrates, die von einem bald nur ziemlich lockeren, bald mehr oder weniger dichten, schwarzbraunen Gewebe durchsetzt sind, das genau so wie das Basalstroma gebaut ist und zwanglos als eine die Perithezien völlig einhüllende Schicht desselben aufgefasst werden kann. Die Aussenkruste der eigentlichen Membran ist ca. 10—20 mm, am Grunde des Ostiolums bis 80 μ dick und besteht aus einigen, meist 3 Lagen von mehr oder weniger stark zusammengepressten, rundlich eckigen, ziemlich dünnwandigen, olivbraunen, ca. 4—8 μ, selten bis ca. 10 μ grossen, oft sehr undeutlichen Zellen, wittert aussen krümelig schollig ab und geht innen rasch in eine 15—20 μ dicke, aus rundlich eckigen, ca. 3.5—6 μ grossen, relativ dickwandigen, kaum oder nur sehr schwach zusammengepressten Zellen bestehende Schicht über. Dort wo diese beiden Schichten aneinander grenzen, ist das Gewebe oft, am Grunde des Ostiolums wohl immer schön wein- oder violettrot gefärbt. Aszi zahlreich, zur Substratoberfläche horizontal und mehr oder weniger parallel liegend, dünn und lang zylindrisch, oben breit abgerundet, unten in einen kurzen Stiel verjüngt, 8-sporig, ca. 450—650 μ lang, 9—10.5 μ dick. Sporen parallel liegend, dünnfädig, beidendig stumpf, kaum verjüngt gerade, selten schwach bogig gekrümmt, mit sehr vielen Querwänden, mit ca. 1.5—2 μ breiter Gallerthülle, schon frühzeitig in den Schläuchen in die einzelnen, kurz zylindrischen, beidendig abgestutzten, 3.5—8 ⇌ 2—3 μ grossen Teilzellen zerfallend. Paraphysen ziemlich spärlich, lang und dünn, aber ziemlich derb fädig, ca. 1.5 μ dick, spät verschleimend.

Auf dürren Blattstielen von *Astragalus* spec. Provinz Schiraz: Tolé-Khosrow, Iran, 24. VII. 1949, leg. B e h b o u d i.

Der hier beschriebene, sehr interessante, prächtig entwickelte Pilz ist auf dem reichlich vorliegenden Material leider nur spärlich vorhanden. In bezug auf die Beschaffenheit des Gehäuses und der Sporen erinnert er an *Plagiosphaera* Petr., ist damit aber gewiss nicht näher verwandt. Er unterscheidet sich von dieser Gattung durch die viel grösseren Perithezien, durch das gestauchte, nicht halsartig verlängerte Ostiolum, durch die in der Übergangszone zwischen der dunklen Aussen- und der hellen Innenschicht, besonders am Grunde des Ostiolums schön violettrot gefärbte Membran, durch die ungefähr gleich langen, nicht in verschiedener Höhe liegenden Aszi, durch die kurzgliederigen, schon frühzeitig in die einzelnen Teilzellen zerfallenden Sporen und durch die zahlreichen, derb fädigen, spät verschleimenden Paraphysen.

Production of zoospores from germinating oospores of Pythium butleri.

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With plates VII—XIV.

Subramanian (1919) in the descriptive account of his *Pythium butleri* set forth the oospores of that fungus as germinating by a germ tube, not by zoospores. Germination of oospores by production of a vegetative germ hypha was likewise described and illustrated by Ramakrishna Ayyar (1929) in his account of an evidently conspecific isolation he obtained from *Opuntia dillenii* (Ker.) Haw. and referred to *P. aphanidermatum* (Eds.) Fitzp. Edson (1915) in presenting his *Rheosporangium aphanidermatum* had mentioned earlier that in some directly observed instances the germinating oospores invariably pushed out germ tubes which later developed into vegetative mycelium. More recently Balakrishnan (1948) noted that oospores of his *P. indicum,* a closely related species, germinated similarly by emission of a germ tube. No reference to oospore germination is found in the account Meurs (1934) gave of his *P. deliense,* or in the brief characterization of the fungus that Sideris (1931) designated as *Nematosporangium aphanidermatum* var. *hawaiiensis.* The statement of Butler (1907) setting forth oospore germination in his *P. indigoferae* as "rapid, by a hypha, not by zoospores" has some pertinent interest here; for, although the published illustrations of that fungus give no decisive indication of its more intimate affinities, Sideris, who had available for study a presumably relevant organism isolated from cucumber (*Cucumis sativus* L.) roots by McRae in India, treated *N. indigoferae* (Butl.) Sideris as a close relative of *N. aphanidermatum* (Edson) Fitzp. and *N. butleri* (Subr.) Sideris. Later Meurs and also Middleton (1943), after firsthand comparison of cultures — neither author mentioned the host from which was originally obtained the isolation of *P. indigoferae* studied by him — likewise treated *P. indigoferae* as a near relative of *P. aphanidermatum,* with which species both authors considered *P. butleri* to be identical.

It has become rather widely accepted that Carpenter (1921) proved the sameness of *Rheosporangium aphanidermatum* and *Pythium butleri* by showing that both were morphologically identical with a fungus he had isolated from sugarcane (*Saccharum offici-*

narum L.) in Hawaii. As Carpenter's illustrations of sexual reproductive apparatus reveal far different antheridial morphology than was figured by Edson and by Subramaniam, the sugarcane fungus manifestly represented a species different from the species described in the United States and in India; so that the proof of identity on which Fitzpatrick (1923) relied in reducing *P. butleri* to synonymy with *P. aphanidermatum* would seem quite worthless. By good fortune, however, the conclusion reached by Carpenter and Fitzpatrick was much more meritorious than the proof; since the general parallelism in antheridial morphology set forth by Edson and Subramaniam gives sound reason for holding *P. aphanidermatum* and *P. butleri* to be intimately related, if not actually identical.

The suggestion conveyed in some writings that Carpenter and Fitzpatrick compared authentic cultures of *P. aphanidermatum* and *P. butleri* is not supported in any statement by either author. Little nomenclatorial significance can be ascribed to some more recent comparisons of cultures designated by the two binomials, for in 1922 when several *Pythium* isolations I had obtained from cucumber and watermelon (*Citrullis vulgaris L.)* fruits needed to be identified Edson informed me that he had lost all cultures of his fungus several years earlier and that all cultures sent to other workers had similarly long been extinct. On examining very kindly a number of isolations which from resemblances in antheridial morphology seemed referable to his species Edson acknowledged that they showed general similarity to *P. aphanidermatum* but that their production of swollen and lobulated parts was much more extensive than any homologous development he had ever seen before. He expressed the same opinion on other isolations of like morphology that were obtained during the ensuing 5 years from various herbaceous crop plants including garden pea (*Pisum sativum* L.), kidney bean (*Phaseolus vulgaris* L.). common tomato (*Lycopersicon esculentum* Mill.), tobacco (*Nicotiana tabacum* L.), common eggplant (*Solanum melongena* L.), sweetpotato (*Ipomoea batatas* (L.) Lam.) and Kentucky blue-grass (*Poa pratensis* L.). His permanent stained slides of asexual reproductive apparatus, about 20 in number, which he allowed me to examine, showed, indeed, much less outward modification of zoosporangia than was commonly displayed in irrigated material of my own isolations. The individual sporangium figured by Edson (1915, pl. 44, fig. 7) was easily recognized, being considerably larger and more richly branched than any other that came under observation. Sporangia of relatively meager outward differentiation like those seen in Edson's slides were later found to be produced commonly in 5 isolations, of which 3 had been obtained in

1927 from sugarcane roots, while the other 2 had originated from diseased tobacco seedlings in Sumatra. All 5 isolations were further distinguished by generally smaller dimensions and some reluctance in zoospore formation. Accordingly the proposal was then made (Drechsler, 1934) to recognize *P. aphanidermatum* as being exemplified in the less robust isolations, whereas *P. butleri* would be held represented in the larger and more strongly lobulated isolations. As, unfortunately, for a long period after 1926 Edson was not available for consultation, no opinion on the 5 less robust isolations, whether favorable or adverse to my proposal, could be obtained from him. Unfortunately, too, his stained slides of *P. aphanidermatum,* representing the last type material of the species, are no longer extant, having been lost before 1942. Restrictions on the transportation of pathogenic cultures and materials have discouraged any survey to determine the distribution of the less robust species, so that it remains undecided whether the fungus could at all likely have been present in the Illinois soil from which Edson obtained his original isolation of *P. aphanidermatum.*

In view of the uncertainties relating to *P. aphanidermatum,* it seems preferable to use the binomial *P. butleri* for the more robust form. As Subramaniam's diagnosis specified oospore germination by a germ tube — Edson likewise saw only such germination — some doubt might arise as to the identity of isolations in which oospores can with unusual readiness be induced to germinate abundantly by the formation of swarm spores. Accordingly the main morphological features of the robust species, as displayed in a few isolations from Virginia and Maryland, are herein briefly set forth firsthand, and some observations are given on its seasonal occurrence that reveal temperature relationships of moment in determining the manner of oospore germination.

Among the species of *Pythium* occurring outdoors in Maryland and adjacent states, *P. butleri* is conspicuous for its frequently copious production of aerial mycelium. With its strong capacity for aerial development would seem associated at times some little tendency toward the epiphytic growth habit characteristic more especially of *P. indigoferae.* Thus after 15 days of unusually wet weather beginning on July 14, 1945, *P. butleri* developed very luxuriantly on vegetable plots near Beltsville, Maryland, producing large wefts of cottony mycelium on numerous crookneck squash (*Cucurbita pepo* L.) fruits attached to vigorous plants at heights 10 to 25 centimeters above the ground (Pl. VII, A—E). Here and there the bulky mycelial masses served in extending the fungus upwards or sideways, for wherever they encountered a neighboring fruit or a succulent petiole the new structure was closely invested by hyphae and penetrated by means

of numerous appressoria similar to those produced in somewhat clustered arrangement (Pl. VIII, A, B) on the floor of a maize-meal-agar plate culture. In dwarf varieties of the kidney bean wefts of aerial mycelium were likewise effective in spreading the fungus from pod to pod 10 to 25 centimeters above the ground. Conspicuous development of aerial mycelium was noted (Drechsler, 1952) also on kidney beans attacked by *P. ultimum* under very moist conditions in a field in Delaware. However, in its capacity to spread well above ground by spanning gaps between neighboring host structures with aerial mycelium *P. butleri* seems equalled only by my *P. myriotylum,* a species not so far known to occur outdoors in Maryland or Delaware, though recurring repeatedly during June and July as causal agent of bean stem-rot in greenhouses near Beltsville, in which temperatures sometimes above 40° C. then apparently inhibit development of all congeneric parasites.

Despite its discomfiture under glass in summer *Pythium butleri* occurs widely outdoors in the middle and northern latitudes of the eastern United States during periods of high temperature and high humidity. In central Maryland it is usually more active in attacking vegetable crop plants during June, July, and August than any other member of the genus, though in these months it may be noticeably injurious only during 15 to 30 days of especially hot wet weather. Late in August the fungus often forms conspicuous cottony wefts on full-grown cucumbers attached to moribund vines in poorly drained areas. Soon afterwards, however, with the onset of cooler weather early in September, it usually vanishes from sight outdoors and until the following June is commonly found active only in greenhouses. An exceptionally early appearance of the fungus in April, 1929, when it attacked tomato seedlings outdoors in many localities in Maryland, would seem to have been attributable to extraordinarily warm, wet spring weather, and more especially, perhaps, to a six-day period from April 4 to April 9 unprecedented so early in the year for prolonged high temperatures. Where *P. butleri* attacks small seedlings or portions of older plants composed mainly of firm rather than of succulent tissues, or where the surrounding air becomes relatively dry, it puts forth little or no external mycelium, so that the injury it causes looks much like the injury of such familiar congeneric parasites as *P. ultimum* Trow and *P. debaryanum* Hesse. Although containing a large mass of very succulent tissue highly favorable for the growth of *P. butleri,* watermelons penetrated by the fungus at the blossom end usually show no aerial mycelium as they undergo complete destruction; for the hard stone-cell layer directly under the epidermis serves here as an effective barrier against external development even in a humid atmosphere.

The adaptation of *Pythium butleri* to high temperatures becomes evident also in its ready production of zoospores in our relentlessly overheated laboratories, where similar development in *P. ultimum* and *P. debaryanum* is wholly precluded. Lavish use of fuel in winter is not usually sufficient to prevent zoospore formation in *P. butleri* either from sporangia of mycelial origin or from germinating oospores. If sizable masses of young vegetative mycelium, such as may be obtained conveniently by cutting pieces of softened tissue from newly infected cucumber fruits or by excising slabs from vigorous lima-bean-agar plate cultures, are transferred to a shallow layer of distilled water, numerous stout hyphae with many irregularly swollen branches grow out from the irrigated material to form a fringe 2 to 3 millimeters wide. At temperatures from 33 to 37° C., often prevailing during summer in laboratories near Beltsville, many of the hyphal outgrowths give rise in a few hours to intricate complexes of distended lobulate branching elements, without however, producing motile zoospores. Zoospores have been found produced rather sparingly in irrigated preparations that were being examined under a microscope at a room temperature of 32° C. At laboratory temperatures between 18 and 30° C. they develop more abundantly, often being liberated in spectacular profusion. In many instances the asexual reproductive unit, or sporangium, that discharges its contents into a terminal vesicle (Pl. VIII, C, v) for transformation into motile swarm spores (Pl. VIII, D, v) consists of several communicating lobulate branches. In many other instances it is composed of a portion of widened axial hypha together with one or several distended lateral branches (Pl. VIII, E, a—f), each sporangial unit after evacuation showing an open discharge tube (Pl. VIII, E, a—f: t). Here and there an empty hypha that in view of its relatively uniform, moderate width (4 to 6 μ) and of its commonplace sparse branching, had evidently not undergone any outward modification, is found divided into segments, mostly 40 to 150 μ long, which, from the open evacuation tube (Pl. VIII, F, a—c:t; G, a:t) borne laterally on each, must have served as zoosporangia. Sometimes, indeed, an empty filamentous segment comes under observation even as a few zoospores — mostly 2 to 5 in number — are being formed in a vesicle at the tip of the lateral discharge tube (Pl. VIII, G, b:t) borne on it. Whatever the shape of their parent sporangium, the liberated swarm spores, after coming to rest and rounding up, often germinate by emission of 1 or 2 germ hyphae (Pl. VIII, H, a—i), especially if the temperature is above 33° C. or if nutrient substances are present in considerable quantity. At lower temperatures (18 to 25° C.) and in the absence of food materials they often discharge their contents through a narrow evacuation tube (Pl. VIII, I, a—l) for conversion into a

secondary motile zoospore. In some very prolific irrigated preparations, where large numbers of encysted zoospores often cohere in floating masses (Pl. VIII, J) visible to the naked eye as delicate scum, empty cyst envelopes and cysts provided individually with a projecting evacuation tube show that repetitional development takes place abundantly at the periphery of the separate masses.

The range of temperatures, including those above 33° C., suitable for development of the distended hyphal branches that later undergo conversion into sporangia, is suitable also for sexual reproduction. In many sexual units all parts are supplied from the same mycelial thread (Pl. IX, A—C:a; Pl. X, A—B:a; Pl. XI, A—E:a; Pl. XII, A—C:a) though the hyphal connection between oogonium and antheridium varies greatly in length. Rather commonly the two branches (Pl. IX, A—C:b, c; C:g, h; Pl. X, A:b, c; Pl. XI, A:b, c; C—F: b, c; Pl. XII, A—B:b, c) supporting, respectively, the oogonium and its attendant antheridium (Pl. IX, A—C:d, e; C, i, j; Pl. X, A:d, e; Pl. XI, A:d, e; C—F:d, e; Pl. XII, A—B:d, e), together with any other intervening portions of hyphae, have an aggregate length of 75 to 225 μ. Monoclinous units in which the combined length of the two branches (Pl. XI, B, b, c; Pl. XII, C, b, c) bearing the oogonium and antheridium (Pl. XI, B, d, e; Pl. XII, C, d, e), together with the length of other connecting hyphal parts, is less than 75 μ, are not usually abundant. In exceptionally compact monoclinous units formed on stout hyphae (Pl. X, B, a) a portion of hypha (Pl. X, B, b) only a few microns long may separate an intercalary antheridium (Pl. X, B, c) from the base of the laterally attached oogonium (Pl. X, B, d) it has fertilized. A large proportion of sexual reproductive units are of diclinous origin, showing no evident mycelial connection between the wide hypha (Pl. IX. C, a; Pl. X, C—G:a; Pl. XII, D—G:a) supplying the oogonium and the neighboring hypha (Pl. IX, C, l; Pl. X, C—G:b; Pl. XII, D—G:b) supplying the antheridium. Very commonly in diclinous as also in monoclinous apparatus a lateral branch (Pl. IX, C, g; Pl. X, D—F:e; Pl. XII, D—F:c) of varying length bears the oogonium (Pl. IX, C, m; Pl. X, D—F:e; Pl. XII, D—F:d) terminally, though occasionally an oogonium (Pl. X, G, c) is formed in laterally intercalary position; the attendant antheridium occupying usually an intercalary (Pl. X, D—F:d; Pl. XII, D—F:e) or a subterminal (Pl. IX, C, n; Pl. X, G, d) position. In instances where a wide hypha (Pl. IX, D, a; Pl. X, C, a; Pl. XII, G, a) gives off a branch (Pl. IX, D, c; Pl. X, C, c; Pl. XII, G, c) bearing two oogonia (Pl. IX, D, d, f; Pl. X, C, e, f; Pl. XII, G, d, e) close together a neighboring hypha (Pl. IX, D, b; Pl. X, C, b; Pl. XII, G, b) may directly supply two adjacent attendant antheridia (Pl. IX, D, e, g; Pl. XII, G, f, g) or may give off a branch (Pl. X, C, d) bearing two attendant antheridia

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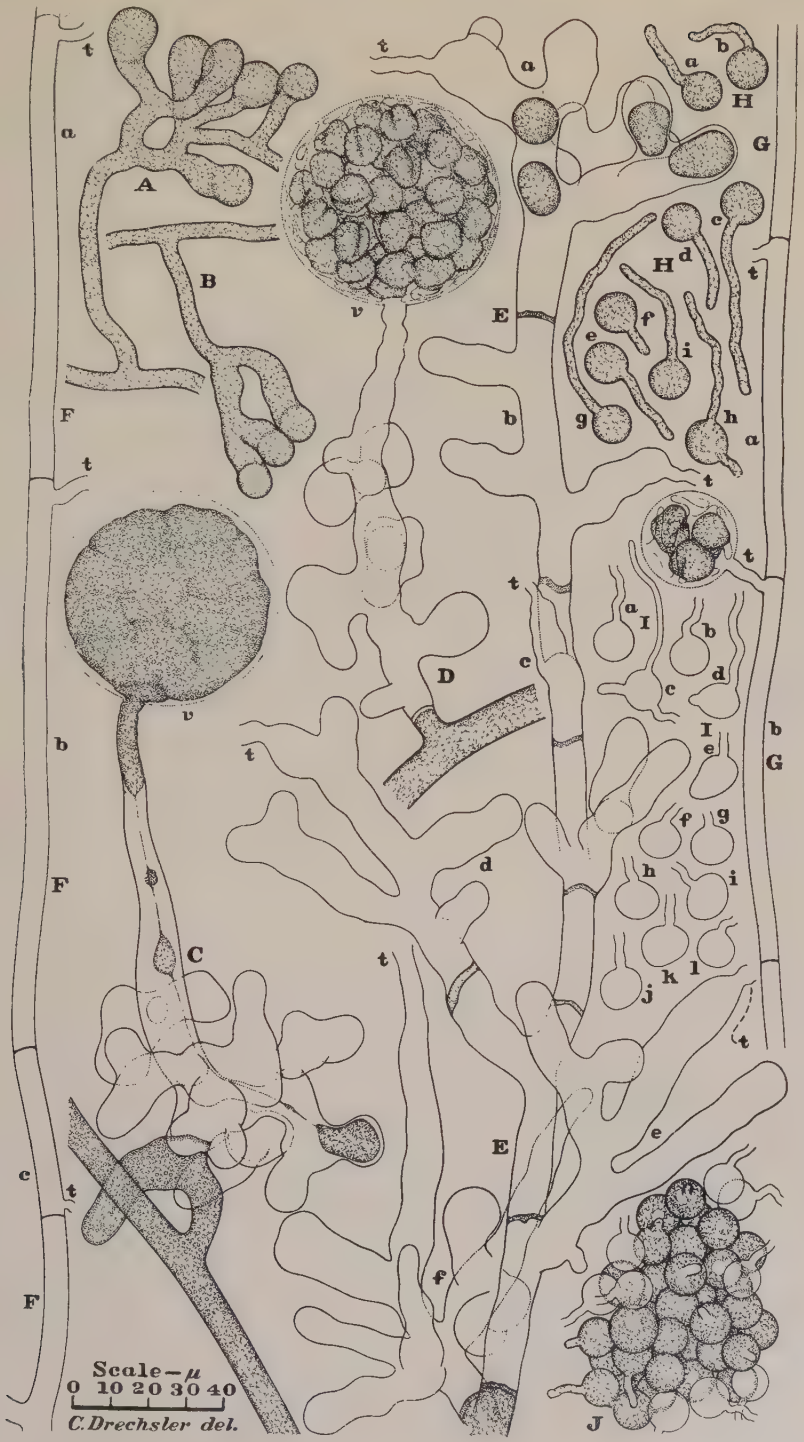
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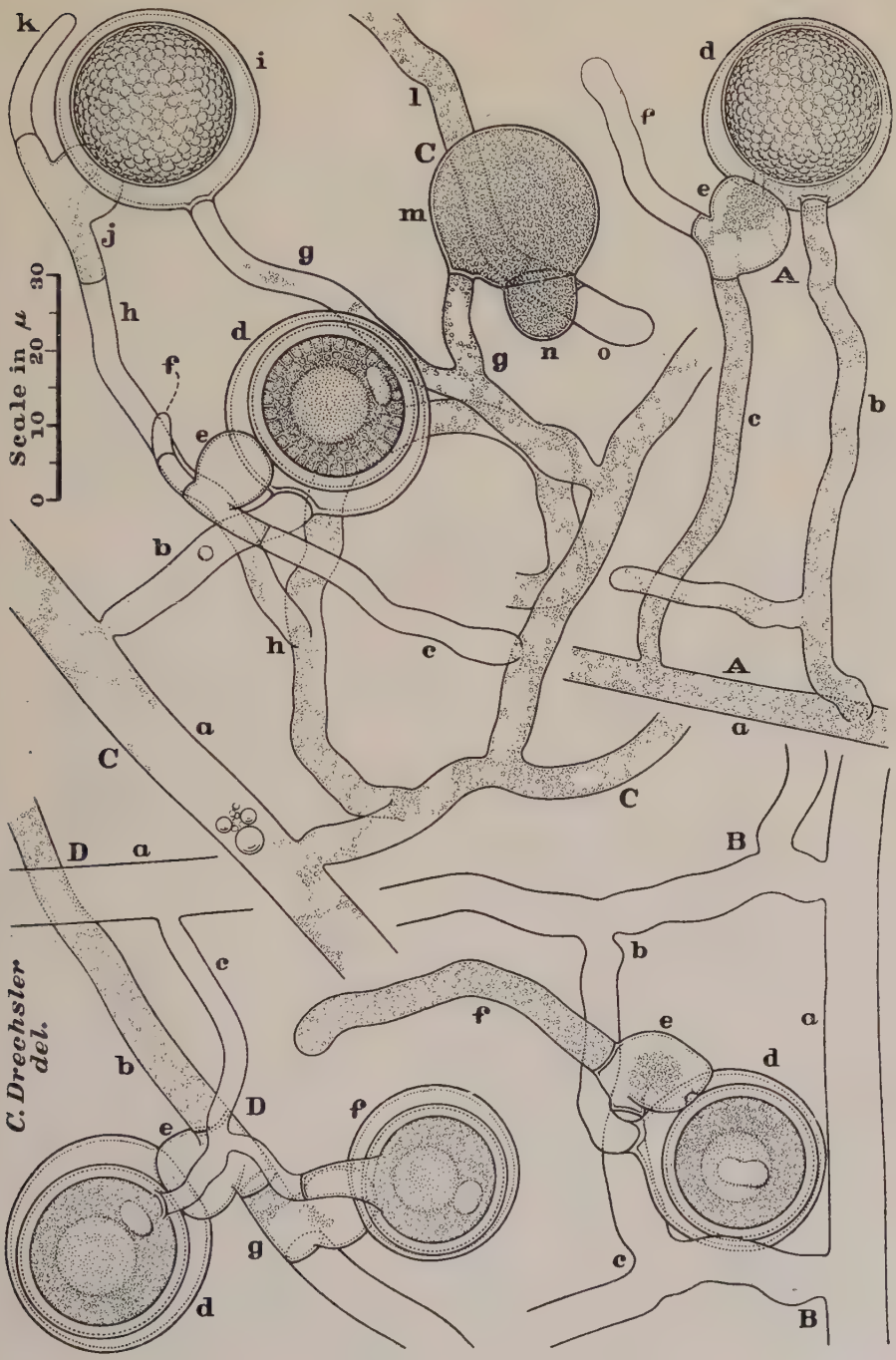
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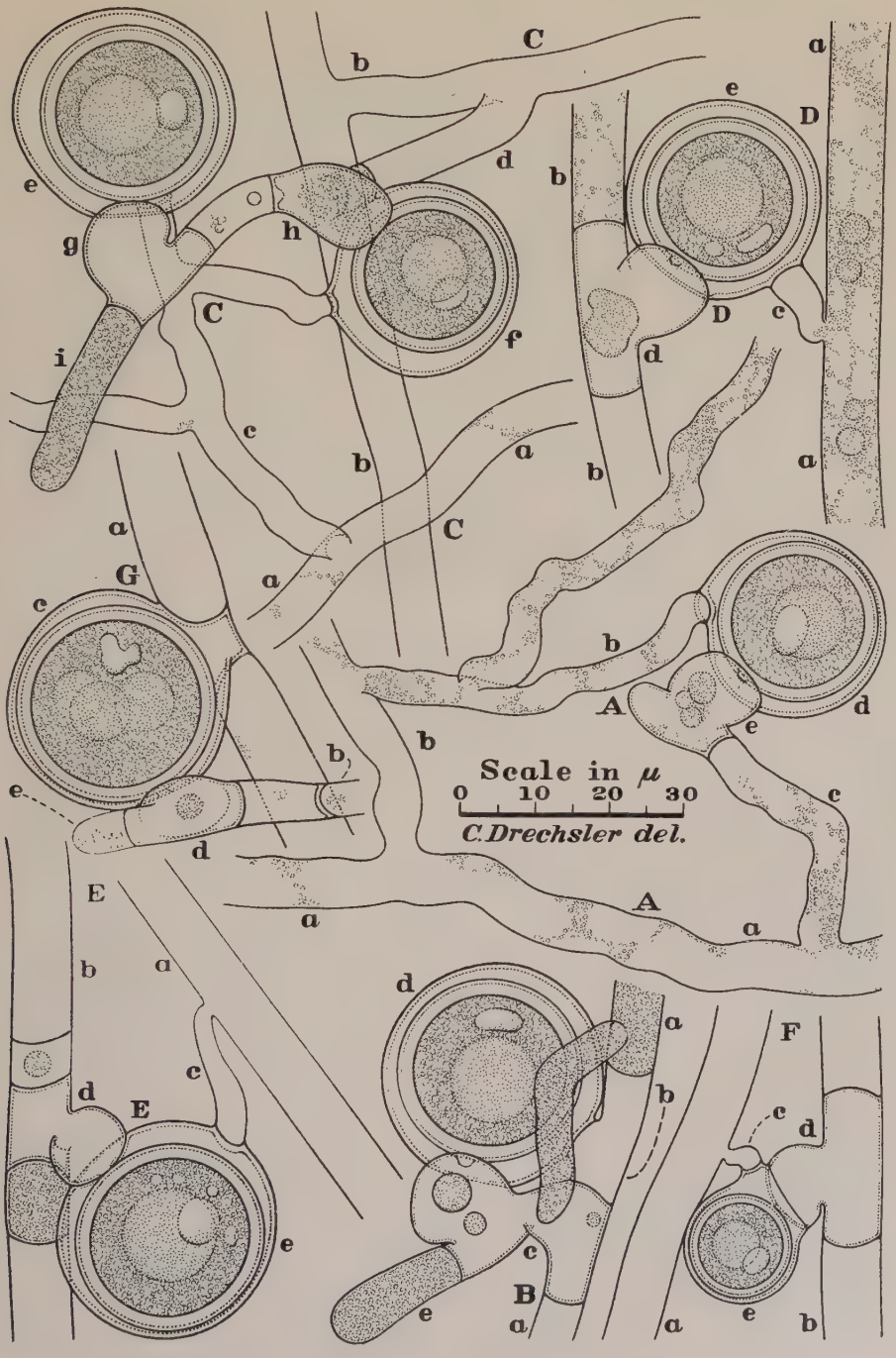
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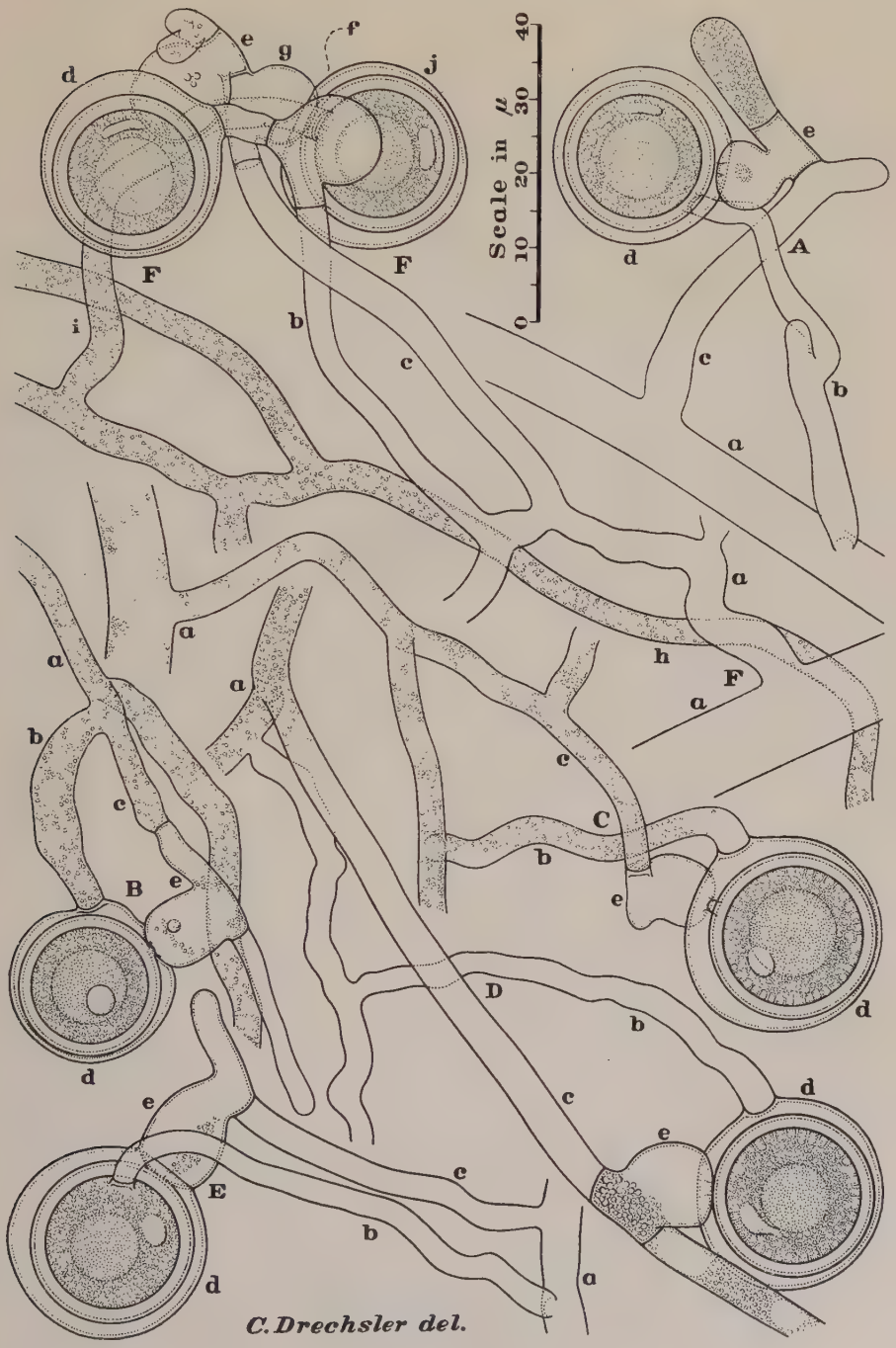
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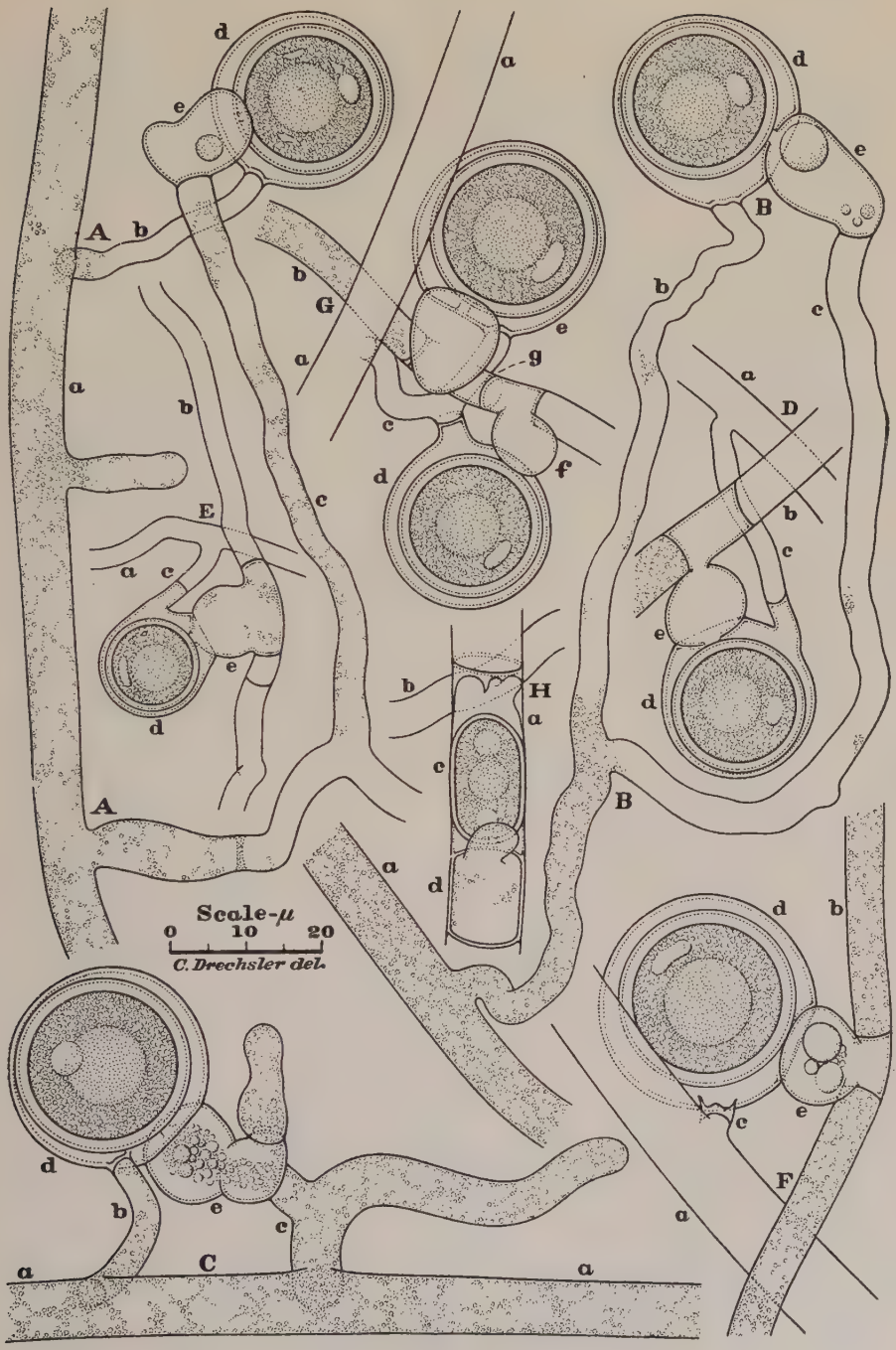
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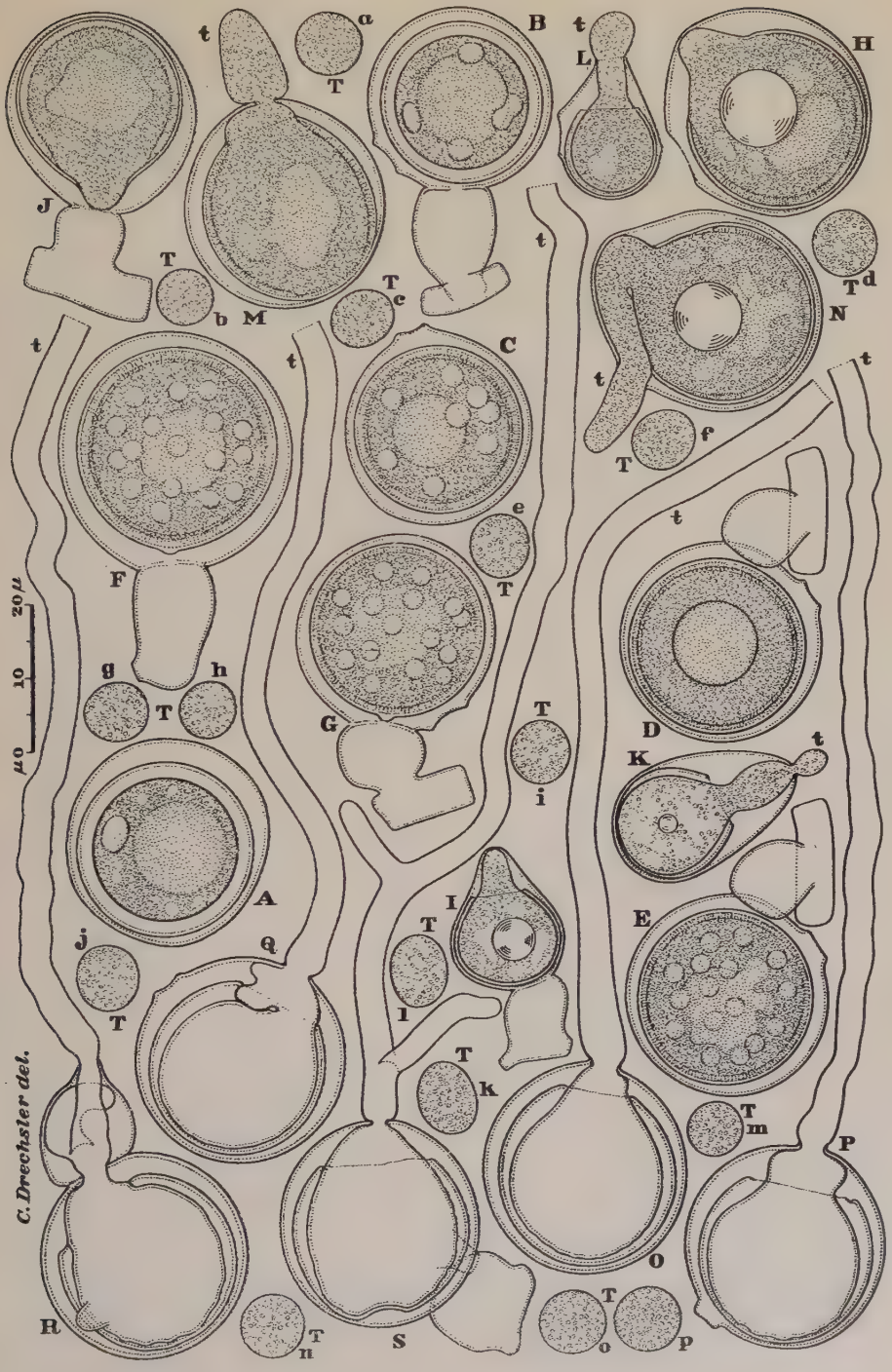

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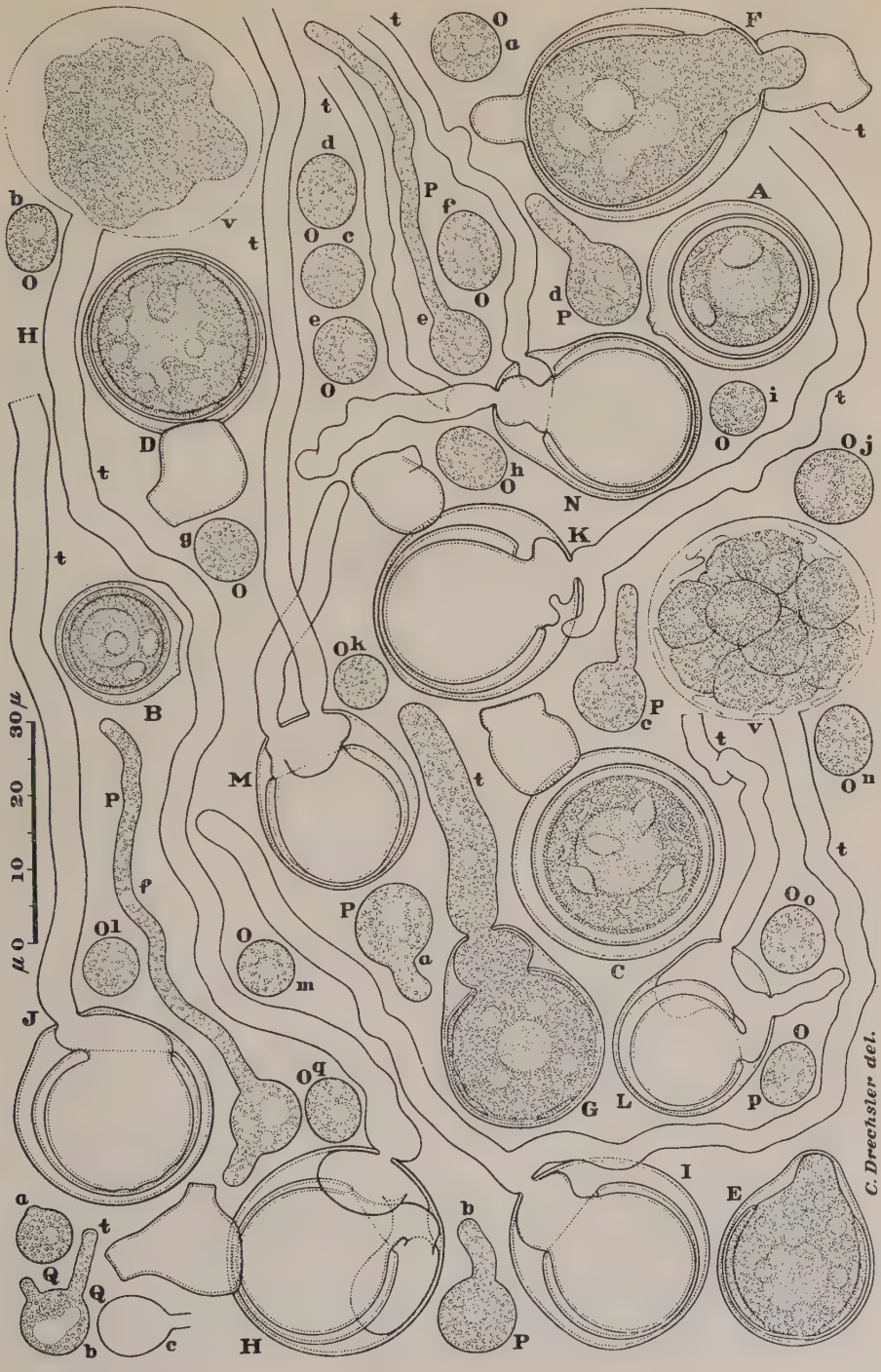
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(Pl. X, C, g, h) only a little apart. How two hyphae may contribute unequally to grouped sexual units is illustrated in the reproductive apparatus shown in Plate XI, F, where one main hypha (Pl. XI, F, a) with 2 sexual branches (Pl. XI, F, b, c) contributes a terminal oogonium (Pl. XI, F, d) and 3 intercalary antheridia (Pl. XI, F, e—g), while the other main hypha (Pl. XI, F, h) with a single sexual branch (Pl. XI, F, i) supplies only an oogonium (Pl. XI, F, j). In aging cultures some rather short cylindrical hyphal segments (Pl. XII, H, a) containing isolated remnants of protoplasm may develop as oogonia; after fertilization from a neighboring hypha (Pl. XII, H, b) or from an adjacent segment (Pl. XII, H, d) has taken place, they form individually an elongated oospore (Pl. XII, H, c). Some relatively small living hyphal segments (Pl. IX, B, f; Pl. X, B, e; C, i) become isolated distad of subterminal antheridia, though in many instances such terminal segments (Pl. IX, A, f; C, f, k, o; Pl. X, G, e) contain little or no protoplasm.

In *Pythium butleri* the fully mature oospore (Pl. XII, A—F:d) shows the internal organization found in most other members of the genus, its single reserve globule of homogeneous consistency being surrounded by a densely granular parietal layer in which is imbedded a flattened or oblate ellipsoidal refringent body. Newly formed oospores of such resting structure commonly fail to germinate when placed in distilled water. As in related species, capacity for germination would seem to require certain modifications of inward structure that first become sparingly noticeable in maize-meal-agar cultures about 15 days after planting, and later are recognizable in steadily increasing numbers of oospores. It seems probable that the tendency of oospores formed at the same time in the same tract of substratum to undergo these modifications after resting periods of variable duration — some oospores undergoing them after a few weeks, others after a few months, and still others after many months — may be helpful in reëstablishing the fungus in successive years despite the caprices of spring and summer weather. After storage for 225 days in a stack under an inverted battery jar at indoor temperature ranging from 18 to 37° C. the maize-meal-agar plate cultures from which was taken the material that with appropriate irrigation yielded the specimens shown in Plates XIII and XIV, showed about one-fifth of all oospores still in a resting condition (Pl. XIII, A).

An initial stage of after-ripening is recognizable in oospores that contain 2 refringent bodies (Pl. XIV, A), and somewhat more advanced stages in oospores displaying 3 (Pl. XIV, B) or 4 (Pl. XIII, B; Pl. XIV, C) refringent bodies. At a later stage when the number of refringent bodies has increased to 8, the reserve globule in some instances (Pl. XIII, C) still retains a subspherical shape. Often no

refringent bodies are discernible in oospores (Pl. XIII, D) examined in newly mounted portions of agar substratum that had dried out badly, the parietal layer in such material presenting a very finely granular texture throughout, and thereby appearing nearly as homogeneous as the sharply defined, accurately spherical reserve globule it surrounds. More than a dozen refringent bodies may come into view when the dried substratum has been immersed in distilled water for an hour, being made visible as the parietal layer acquires a coarsely granular texture (Pl. XIII, E); the mass of reserve material meanwhile diminishing in volume as its boundary becomes irregular and less distinct. The distribution of cellular components here revealed after immersion in water is similar to that normally achieved by oospores in moist substratum through continued multiplication of refringent bodies and gradual encroachment of the parietal granular layer on the reserve globule (Pl. XIII, F, G; Pl. XIV, D).

Soon after the multiplication of refringent bodies has begun, the thick, slightly yellowish inner layer of the oospore wall darkens perceptibly. The layer gradually turns somewhat opaque, its substance appearing more and more like that of the adjacent protoplasm (Pl. XIII, C—G; Pl. XIV, B, C). In one region, or perchance in two regions (Pl. XIV, D), the inner layer now vanishes completely. A protrusion of the protoplast pushes its way through a resulting gap into the oogonial chamber (Pl. XIII, H—J; Pl. XIV, E). After growing straightforward or sideways, often rather massively, within the oogonial chamber the protrusion presses through the oogonial envelope to emerge externally as a germ tube (Pl. XIII, K—N:t). In instances where the protrusion uses the fertilization aperture as passageway (Pl. XIV, F, t) it needs further to break through the antheridial wall, should this membrane still remain attached. With the continued elongation of the germ hypha (Pl. XIV, G, t) all refringent bodies become indiscernible. The protoplasm in which they are lost to view shows densely granular, dispersedly vacuolate texture at it continues to digest materials in the diminishing reserve globule and to assimilate materials from the inner layer of the oospore wall.

Whether an elongating germ hypha will grow into an extensive mycelium or will serve as an evacuation tube in the production of zoospores is determined mainly by external conditions. The same conditions that will discourage swarm-spore development from sporangia of mycelial origin — presence of nutrient substances in considerable quantity, temperatures in excess of 33° C. — will likewise discourage zoospore production from germinating oospores, and consequently will constrain germ hyphae to grow out vegetatively. Similarly, conditions favorable for zoospore production from ordinary sporangia — lack of food materials in the surrounding water, tempera-

tures well below 33° C. — seem favorable also for zoospore production from germinating oospores. Accordingly, if irrigated preparations of oospores are largely freed of residual nutrients by changing the water from time to time, germination by the production of swarm spores often increases markedly. Where oospores are tried out that have been taken from old Petri plate cultures contaminated with molds and bacteria, repeated renewal of water should in many instances help zoospore formation also by removing harmful substances elaborated by the alien microorganisms.

Where a germinating oospore is to serve as a sporangium the germ hypha ceases to elongate and forms a hyaline cap at its tip. This cap suddenly yields and is inflated into a vesicle (Pl. XIV, H, v) as the protoplasmic contents of the oospore flow into it from the germ hypha, now functioning as evacuation tube (Pl. XIV, H, t). The emptied membranous parts (Pl. XIII, O—S; Pl. XIV, H—N) show a few noteworthy features. Within the persisting colorless layer of the oospore wall is inclosed a smaller envelope, evidently interpretable as sporangial wall, since it appears continous with the wall of the protrusion inside the oogonial chamber as well as with the wall of the evacuation tube (Pl. XIII, O—S:t; Pl. XIV, H—N:t). This inner wall is much more distinct than any homologous membrane observable in *Pythium ultimum* or *P. debaryanum*. As a rule it is widely separated from the persistent outer layer of the oospore wall near the region where it enters the oogonial chamber, and appears clearly discrete throughout the antipodal region. The sporangial protrusion within the antheridial chamber sometimes shows rather massive lobulated development (Pl. XIV, II, L—M) and may then extend two separate germ hyphae through the oogonial wall (Pl. XIV, L—M). Usually only one hypha serves as evacuation tube (Pl. XIV, L—M:t), but in some instances two hyphae are found open at the tip (Pl. XIV, N, t, t). Outside the oogonial envelope an evacuation tube may give off one (Pl. XIV, I, K, N) or two (Pl. XIII, S, t) branches. In instances where the evacuation tube has pushed through the fertilization orifice, it may give off a branch in the antheridial chamber (Pl. XIII, R). Functional evacuation tubes produced in shallowly irrigated preparations mostly vary in length from 25 to 225 μ. The longer tubes are generelly produced by the larger oospores. Unbranched tubes are usually longer than branched ones, and single functional evacuation tubes seem generally longer than plural tubes.

After the undifferentiated mass of protoplasm from the oospore has been received into the vesicle (Pl. XIV, H, v) it undergoes cleavage and conversion into laterally biciliate zoospores (Pl. XIV, I, v) in the usual manner. From 4 to 18 swarm spores are commonly liberated, the number depending mainly on the size of the parent

oospore. Following a period of active motility they come to rest and round up (Pl. XIII, T, a—p; Pl. XIV, O, a—q). In many instances they germinate soon afterwards by putting forth one (Pl. XIV, P, a—e) or two (Pl. XIV, P, f) germ tubes. In other instances, however, a zoospore (Pl. XIV, Q, a) derived from a germinating oospore produces an evacuation tube (Pl. XIV, Q, b:t) and empties out its contents (Pl. XIV, Q, c) for conversion into a secondary swarm spore.

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Explanation of Plates VII—XIV.

Plate VII: Crookneck squash plants showing 5 fruits, A—E, at heights 10 to 25 centimeters above the ground, spontaneously attacked by *Pythium butleri* and in varying measure enveloped by aerial mycelium of the fungus. The plant bearing fruits A and E shows also rather extensive infection of the thick succulent petioles. Photographed outdoors in a field at the Plant Industry Station near Beltsville, Maryland, on July 29, 1945. Approximately × ¼.

Plate VIII. Asexual reproductive apparatus of an isolation of *Pythium butleri* obtained from a watermelon fruit found affected with buff-colored blossom-end rot in a field in Arlington, Virginia, on August 5, 1922; parts A and B produced in a maize-agar plate culture; parts C—J produced from slabs which after removal from a Lima-bean-agar culture had been placed in a shallow layer of distilled water; × 500 throughout. A, B, Portions

of mycelial hyphae with grouped appressoria formed on glass of Petri dish. C, Lobulate sporangium that has nearly completed the discharge of its protoplasmic contents into a vesicle, v. D, Empty lobulate sporangium showing about 30 motile zoospores within vesicle, v. E, Distended submerged hyphal outgrowth showing 6 empty sporangia, a—f, each with its evacuation tube, t, open at the tip. F, Externally unmodified hypha showing 3 empty sporangia, a—c, each with evacuation tube, t, open at the tip. G, Unmodified hypha showing one empty sporangium, a, with open evacuation tube, t, and another empty sporangium, b, with an open evacuation tube, t, surmounted by a vesicle containing 3 active zoospores. H, Encysted zoospores, a—i, germinating by emission of one or two germ tubes. I, Empty membranous envelopes, a—l, each of which was emptied in the production of a secondary zoospore. J, Cohering group of encysted zoospores, showing 9 that have each given rise to a secondary zoospore, and 8 others that are each extending a slender evacuation tube.

Plate IX. Sexual reproductive apparatus formed in a maize-meal-agar plate culture by an isolation of *Pythium butleri* obtained from a kidney-bean plant found affected with stem rot in a field near Beltsville, Maryland, on June 27, 1949; × 1000 throughout. A, B, Monoclinous reproductive units: a, main hypha; b, oogonial branch; c, antheridial branch; d, oogonium (immature in A, with mature oospore in B); e, antheridium; f, terminal hyphal segment. C, Wide hypha, a, supplying 2 monoclinous reproductive units, b—f and g—k, composed, respectively, of oogonial branch (b, g), antheridial branch (c, h), oogonium (d, i), antheridium (e, j), empty distal segment (f, k); these being connected with a diclinous reproductive unit, g and l—o, composed of oogonial branch (g), antheridial branch (l) oogonium (m), antheridium (n), distal hyphal segment (o); oogonium d contains a nearly mature oospore, oogonium i contains a young oospore, and oogonium m is still unfertilized. D, Two main hyphae, a and b, supplying 2 mature diclinous reproductive units, c—e and f—g; the ramified oogonial branch (c) bears terminally the 2 oogonia (d, f) that are fertilized by the 2 adjacent antheridia (e, g) borne intercalarily in hypha b.

Plate X. Sexual reproductive apparatus formed in a maize-meal-agar plate culture by an isolation of *Pythium butleri* obtained from a kidney-bean plant found affected with stem rot in a field near Beltsville, Maryland, on June 27, 1949; × 1000 throughout. A, Mature monoclinous reproductive unit: a, wide hypha; b, oogonial branch; c antheridial branch; d, oogonium; e, antheridium. B, Mature monoclinous reproductive unit borne compactly on a wide hypha, a; only a short portion of an empty segment, b, separates the laterally intercalary antheridium, c, from the oogonium, d; e, living terminal segment. C, Two main hyphae, a and b, from which are given off, respectively, the ramified oogonial branch, c, and the antheridial branch, d; the oogonia, e and f, are fertilized, respectively, by the intercalary antheridia, g and h; i, living terminal segment; oospores in both oogonia are in fully mature resting state. D—F, Three mature diclinous reproductive units, each of which is supplied from 2 wide hyphae, a and b; c, oogonial branch; d, intercalary antheridium; e, oogonium. G, Diclinous reproductive unit supplied from two main hyphae, a and b; c, laterally intercalary oogonium; d, antheridium; e, short terminal segment.

Plate XI. Sexual reproductive apparatus formed in a maize-meal-agar plate culture by an isolation of *Pythium butleri* obtained from a kidney-bean plant found affected with stem rot in a field near Beltsville, Mary-

land, on June 27, 1949; × 1000 throughout. A—E, Five monoclinous reproductive units: a, parent hypha; b, oogonial branch; c, antheridial branch; d, oogonium; e, antheridium; oospores very nearly mature in C and D, and in fully mature resting state in A, B and E. F, Mature monoclinous reproductive unit, a—e, connected with mature diclinous unit, f—j: a wide hypha (a) supplies 2 sexual branches (b, c) which together bear not only an oogonium (d) and its attendant antheridium (e) but also other antheridia (f, g) that both have fertilized a second oogonium (j) borne on a branch (i) given off by a neighboring main hypha (h); the close hyphal connection between oogonium d and antheridium f being somewhat exceptional.

Plate XII. Sexual reproductive apparatus formed in a maize-meal-agar plate culture by an isolation of *Pythium butleri* obtained from a kidney-bean plant found affected with stem rot in a field near Beltsville, Maryland, on June 27, 1949; × 1000 throughout. A—C, Three fully mature reproductive units: a, parent hypha; b, oogonial branch; c, antheridial branch; d, oogonium; e, antheridium. D—F, Three mature diclinous reproductive units, each supplied from 2 neighboring hyphae, a and b, of which one (a) gives off a branch, c, bearing an oogonium, d, that is fertilized by an antheridium, e, borne intercalarily on the other hypha (b). G, Two mature monoclinous reproductive units supplied from 2 neighboring hyphae, a and b, of which one (a) gives off a branch, c, bearing 2 oogonia, d and e, that are fertilized, respectively, by 2 antheridia, f and g, borne intercalarily on the other hypha (b). H, Mature diclinous reproductive unit formed from remnants of protoplasm in 2 neighboring hyphae, a and b; the ripe oospore, c, shows 2 reserve globules, owing to its elongated shape; a segment, d, adjacent to the cylindrical oogonial segment may have served as an extra antheridium.

Plate XIII. Reproduced apparatus observed in irrigated preparations of oospores taken from a 225-day-old maize-meal-agar plate culture of an isolation of *Pythium butleri* obtained from the crookneck squash fruit shown in Figure 1, B; × 1000 throughout. A, Oospore still in resting condition. B, Oospore showing some after-ripening in that it contains 4 refringent bodies. C, Oospore showing 8 refringent bodies and darkened inner layer of wall. D, Oospore from dried — out portion of old culture; no refringent bodies discernible in the fine — textured parietal layer surrounding the sharply defined reserve globule; inner layer of wall darkened. E, Same oospore after immersion in distilled water for 1 hour; many refringent bodies now visible in coarsely granular parietal layer; reserve globule now of irregular shape. F, G. Oospores in advanced stage of after-ripening: many refringent bodies discernible; reserve globule irregular; inner layer of oospore wall becoming obliterated. H—J, Oospores in early stage of germination, with protoplast protruding into oogonial chamber. K—N, Oospores, each with a germ tube, t, elongating externally. O—S, Empty membraneous envelopes left after escape of motile zoospores from vesicle at open tip of evacuation tube, t. T, Encysted zoospores, a—p, that originated from germinating oospores.

Plate XIV. Reproductive apparatus observed in irrigated preparations of oospores taken from a 225-day-old maize-meal-agar plate culture of an isolation of *Pythium butleri* obtained from the crookneck squash fruit shown in Figure 1, B; × 1000 throughout. A, Oospore showing 2 refringent bodies. B, Oospore in somewhat more advanced stage of after-ripening, showing 3 refringent bodies and darkening of inner layer of its wall.

C, Oospore with 4 refringent bodies. D, Oospore with inner layer of wall dissolved away in 2 regions. E, Oospore in early stage of germination, with protoplast protruding broadly against oogonial envelope. F, Oospore extending germ tube, t, into antheridial chamber. G, Oospore with germ tube, t, elongating externally. H, Oospore that has discharged its protoplasm through an evacuation tube, t, into a terminal vesicle, v. I, Oospore that has discharged its protoplasm through an evacuation tube, t, into a vesicle, v, where 13 motile zoospores have been formed, J—M. Empty membranous envelopes left after liberation of motile zoospores from vesicle at open tip of evacuation tube, t. N. Empty membranous envelopes with 2 evacuation tubes, t, each open at its tip. O, Encysted zoospores, a—q, which originated through germination of oospores. P, Encysted zoospores, a—e, each germinating by emission of a broad vegetative germ tube; f, zoospore putting forth two germ tubes. Q, Three zoospores, a—c, showing different stages of repetitional development: a, narrow evacuation tube beginning to grow out; b, evacuation tube, t, surmounted by hyaline cap; c, empty membrane with open evacuation tube.

Allelochaeta n. gen., eine neue, biciliate Melanconieen-Gattung.

Von F. Petrak (Wien).

Allelochaeta Petr. n. gen.

Acervuli dispersi, in vel sub epidermide evoluti, nunc minores, ambitu orbiculares vel elliptici, nunc majores, saepe plus minusve irregulares, primo epidermide pustulatim elevata tecti, ea rupta in maturitate plus minusve late aperti; strato basali ubique circiter aequali crassitudine, pseudoparenchymatico, minute celluloso, subhyalino vel pallidissime flavo-brunneolo; conidia fusoidea, plerumque recta, pluriseptata, pallide mellea vel olivascentia, loculis extremis hyalinis, minute conicis, utrinque ciliis duabus tenuiter filiformibus, plus minusve horizontaliter divergentibus praedita; conidiophora totam strati basalis superficiem obtegentia, papilliformia vel brevissime bacillaria, mox viescentia et omnino mucosa.

Fruchtkörper zerstreut, sich in und unter der Epidermis entwickelnd, bald klein, im Umriss rundlich oder elliptisch, bald grösser, dann oft ganz unregelmässig, flach pustelförmig vorgewölbt, nur von der bei der Reife ganz unregelmässig aufreissenden Epidermis bedeckt. Basalschicht ganz flach, überall ungefähr gleich dick, von kleinzelligem, subhyalinem oder sehr hell gelbbräunlichem Gewebe. Konidien spindelförmig, meist gerade, mit mehreren Querwänden, hell honiggelb oder olivbräunlich, mit hyalinen, stumpf konischen Endzellen, 24.5 ⇌ 5 μ, an beiden Enden mit je zwei dünnfädigen, mehr oder weniger, oft fast horizontal divergierenden Zilien versehen. Konidienträger nur unten, die Innenfläche der Basalschicht dicht überziehend, papillen- oder sehr kurz stäbchenförmig, bald ganz verschleimend.

Allelochaeta Gaubae Petr. n. spec.

Acervuli amphigeni, irregulariter laxe vel subdense dispersi, solitarii, interdum etiam bini compluresve plus minusve aggregati, tunc plus minusve connati et confluentes, in- vel sub epidermide evoluti, nunc minores, ambitu orbiculares vel elliptici, ca. 150—300 μ diam., nunc majores, tunc sinuoso-angulosi et plerumque omnino irregulares, usque ad 700 μ diam., confluendo etiam majores, primo epidermide pustulatim elevata tecti, ea rupta in maturitate plus minusve late aperti, strato basali ubique circiter 10—13 μ, raro usque ad 23 μ crasso, plano, pseudoparenchymatico, e cellulis rotundato-

angulosis, tenuiter tunicatis, subhyalinis vel pallidissime olivascentibus, 3—8 μ diam. metientibus composito; conidia anguste fusoidea, utrinque attenuata et subacuminata, recta, raro inaequilatera vel curvula, 4- raro 3- vel 5-septata, non vel lenissime constricta, loculis mediis pallide melleis vel olivascentibus, episporio ca. 1 μ crasso, extremis hyalinis conicis, utrinque ciliis filiformibus, 5—16 μ longis, vix 1 μ crassis, erecto- vel fere horizontaliter patentibus, facile decidentibus aucta, 21—30 ⇌ 4—5.5 μ; conidiophora totam strati basalis superficiem obtegentia, papilliformia vel brevissime bacillaria, mox viescentia et mucosa.

Fruchtlager beiderseits, ohne Fleckenbildung, unregelmässig locker oder ziemlich dicht zerstreut, oft einzeln, bisweilen aber auch zu zwei oder mehreren dicht gehäuft beisammenstehend, dann mehr oder weniger, oft ganz zusammenfliessend, sich in oder unter der Epidermis entwickelnd, bald klein, im Umriss rundlich oder elliptisch, ca. 150—300 μ im Durchmesser, bald grösser, dann oft etwas buchtig und eckig, mehr oder weniger unregelmässig, bis ca. 700 μ gross, selten und dann wohl immer nur durch Zusammenfliessen auch noch etwas grösser werdend, nur von der flach pustelförmig vorgewölbten, bei der Reife unregelmässig aufreissenden Epidermis bedeckt. Basalschicht ganz flach, der Epidermisinnenwand oder der subepidermalen Zellschicht des Mesophylls auf- und oft auch etwas eingewachsen, ca. 10—13 μ, selten bis ca. 23 μ dick, von pseudoparenchymatischem, aus rundlich oder unregelmässig eckigen, ziemlich dünnwandigen, subhyalinen oder hell olivbraunen, 3—5 μ, selten bis 8 μ grossen Zellen bestehendem Gewebe. Konidien schmal spindelförmig, beidendig ziemlich stark verjüngt, stumpf zugespitzt, gerade, selten ungleichseitig oder schwach gekrümmt, mit 4, selten 3 oder 5 Querwänden, nicht oder nur sehr schwach eingeschnürt, die mittleren Zellen sehr hell honiggelb oder olivbräunlich, mit ca. 1 μ dickem Epispor und hyalinen, dünnwandigen, konischen Endzellen, 21—26 μ, selten bis 30 μ lang, 4—5.5 μ dick, an jedem Ende 2, seltener nur eine fädige, ziemlich gerade oder nur schwach gekrümmte, aufrecht oder fast horizontal abstehende, hyaline, besonders unten leicht abfallende, 5—16 μ lange, kaum 1 μ dicke Zilie tragend. Konidienträger die ganze Oberfläche der Basalschicht überziehend, papillen- oder kurz stäbchenförmig, bald verschrumpfend und verschleimend.

Auf dürren, noch hängenden Blättern von *Callistemon lanceolatus*; near Rylstone, N.S.W. 7. III. 1954.

Die Gattung *Allelochaeta* ist mit *Pestalozzia* De Not., *Monochaetia* Sacc., *Cryptostictis* Fuck., *Amphichaeta* Mc. Alp. und *Heteroceras* Sacc. verwandt. Sie unterscheidet sich von den beiden zuerst genannten Gattungen durch die dünn spindeligen, hell gefärbten, beidendig

mit je 2 Zilien versehenen Sporen. *Cryptostictis* ist durch die nur unten mit 1 Zilie versehenen Konidien, *Amphichaeta* durch längliche oder ellipsoidische, beidendig mit je einer Zilie versehene Konidien mit fast opak schwarzbraunen Mittelzellen *Heteroceras* durch die oben mit einer, in der Mitte mit 2—3 Zilien versehenen Konidien wesentlich verschieden.

Das vorliegende Material ist zwar ziemlich reichlich, zeigt aber den Pilz nur in ganz altem oder überreifem Zustande. Er gehört als Nebenfruchtform zu einem Pyrenomyzeten, über den später bei einer anderen Gelegenheit noch zu berichten sein wird.

Synchytrium shuteriae and other doubtful Species.

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With 9 Textfig.

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Synchytrium shuteriae was described by Henning (1895) as a parasite of *Shuteria africana* which G. Volkens collected near Kilimandscharo, in German East Africa, and he diagnosed it as follows: "maculis pallidis rotundatis, tuberculis amphigenis sparsis vel confluentibus, subhemisphaericis applanatis, dein irregulariter rugosis, flavescenti-viridulis dein subfuscescentibus, 0.3—1 mm diametro, plerumque e pluribus cellulis perdurantibus formatis; sporis globosis vel subellipsoideis, saepe acutangulis, flavosubfuscescentibus 10—15 ⇌ 9—13 μ, episporio levi, 1—1.5 μ crasso, subhyalino."

In 1912 Tobler studied specimens of this species in the Berlin herbarium and came to the conclusion that it may not be a valid species of *Synchytrium,* or that more than one fungus is present on the host. Recently, through the generosity of Dr. Sten Ahlner, the author received material of this species from the Riksmuseet in Stockholm, Sweden, which was collected by G. Volkens near Kilimandscharo, June 13, 1894, and a study of fixed and stained sections of this material has shown that *S. shuteriae* is a true *Synchytrium* species which is very similar to members of the subgenus *Woroninella.* Accordingly, this brief paper is presented to show the characteristics of this species.

The galls induced by *S. shuteriae* on its host are relatively sparse, separate and scattered, or crowded and confluent as described by Henning. With the exception of one resting spore gall which may not belong to *S. shuteriae,* only sporangial galls are present in the Stockholm material at hand, and most of these are unusually large. As shown in fig. 1 of an isolated gall, they are predominantly subhemispherical or dome-shaped with a slight apical depression, 186—300 μ high by 318—500 μ in longitudinal section with a sheath 3—5 cells thick. The sheath cells are markedly enlarged and vesicular when turgid, but as they dry out they collapse and become wrinkled to give the galls a rugose appearance, as noted by Henning. The

galls protrude conspicuously on the surface of the host, and because of the thinness of the leaf they frequently bulge out on the opposite side. In many cases a gall may protrude equally on both sides of the leaf. Confluent galls are usually quite large and may be up to 1000 μ or more in diameter. The sori in such galls may be elongate and irregular, and when they have dehisced confluent galls usually become dark-brown and often appear to be spongy and ramified by irregular cavities. Such galls apparently are the type illustrated by Tobler in her fig. 60.

As the isolated galls dehisce the upper portion of the sheath breaks open and sloughs off, leaving the gall cup-shaped and filled with the sorus of sporangia. The latter adhere closely together and do not appear loose and powdery like those of most members of the subgenus *Woroninella.* However, these observations are of dried herbarium material, and the appearance of the sporangia may be quite different in living material.

The sori are yellow or yellowish-golden in color with a thin hyaline, 1.5—1.8 μ thick, smooth wall, and predominantly oval in shape, 150—252 ⇌ 288—450 μ. They may often extend up in the narrow neck of the infected cell at the apex and become somewhat beaked or papillate in shape as shown in fig. 2. No evidence of a prosorus was found in any of the sporangial galls, and apparently the initial cell of the fungus is transformed directly into a sorus or sporangia at maturity. The sporangia are quite small and numerous so that up to and more than 1000 are present in a sorus. They are multinucleate, predominantly polyhedral in shape and vary from 9—15 μ in greatest diameter with a thin, 1.5 μ thick, hyaline wall and finely granular, yellowish content (fig. 3). In ruptured and largely empty sori where the forces of mutual contact and pressure are reduced or absent, the Sporangia are oval, 9—13 ⇌ 10—15 μ, or almost spherical, 8—13 μ (fig. 4). In some of these cleavage segments or incipient zoospores are present, but because of their shrunken condition, it is difficult to measure them accurately.

Only one subhemispherical, 240 μ high by 250 μ broad, resting spore gall with a sheath 2—3 cells thick, was found in sections of infected leaves. This gall contained a single oval, 86 ⇌ 129 μ, resting spore with a 3 μ thick, reddish-brown wall which was slightly rough from a sparse amount of adhering residue (fig. 5). No sporangial galls were present in association with this resting spore and its gall, and it is not certain that they relate to *S. shuteriae.* After the discovery of this gall the author examined all galls present on the leaves in the Stockholm collection without finding another resting spore. In view of this the author is inclined to believe that this gall and spore are extraneous or relate to another species. As noted previously this

species resembles very closely members of the subgenus *Woroninella*. Its galls are quite large and become cupulate when dehisced, and the sporangia are unusually numerous and small. Furthermore, it occurs on a genus of the Leguminosae, which is the host family of all known species of *Woroniella*. Its large galls and beaked sori are quite similar to those of *S. minutum*, but its sporangia are smaller than those of any other members of the subgenus. On the basis of the above characteristics the author is placing *S. shuteriae* temporarily in the subgenus *Woroninella*, but it is obvious that if the resting spore gall and spore noted above belong in its life cycle it is not a member of this subgenus.

In connection with this study of *S. shuteriae* several other questionable species were examined carefully in the Stockholm collection with the objective of determining their validity. These include *S. dendriticum* Fuckel, *S. centranthi* Rabenhorst, *S. bupleuri* Kunze, *S. trifolii* Passerini, *S. groenlandicum* Allescher, and *S. montanum* Zopf. As in the case of *S. shuteriae* the herbarium specimens were carefully studied in toto after which small heavily infected areas were thoroughly soaked in water, fixed in a vacuum to remove air, embedded, sectioned and stained to determine the structure of the galls and fungus.

Synchytrium dendriticum was collected by Fuckel on *Dentaria bulbifera* in Oestrich (Nassau) Germany and described by him (1866) as *Chytridium dendriticum* in the following manner: "tuberculis in foliorum paginae superioris in macula flavescenti, minutissimis dendriticoseratis, fuscis; soris solitariis, globosis, griseis; zoosporis globosis mnutissimis, hyalinis." In 1869 he transferred it to *Synchytrium* and gave the same diagnosis with the exception that the description of the zoospores was omitted. Since Fuckel's time it was reported from Switzerland on *Dentaria pinnata* by Cruchet (1906), but he did not describe it further. Tobler studied specimens of Fuckel's collection from Kew and found that the fungus occurs in the tissues between the lower and upper epidermis of the leaf. She regarded the reported sori as resting spores and believed that this is a valid species that might be related to *S. endobioticum* because of its deep-seated position in the host tissue. The author has studied part of Fuckel's original collection and confirms Tobler's observations on the position of the fungus, and its characteristics.

The fungus occurs in golden-yellow patches which may sometimes follow the veins and veinlets of the leaves and form rather well-defined spots or discolored areas. In the latter symptoms it is unlike most species of *Synchytrium*. As shown in fig. 6, the resting spores (?) occur in greatly enlarged palisade and mesophyll cells which are polyhedral, globular, 30—48 μ diam., or broadly pyriform

irregular vacuole (fig. 6, 7). Sections of more than a hundred spores in shape. The walls may be up to 3 μ in thick ness and are hyaline, but these may appear yellowish-golden from the color of the resting spore content when viewed *in toto*. The resting spores (?) usually fill the host cell only partly (fig. 7) and are sperical, 18—38 μ, or oval, 17—20 ⇌ 22—30 μ, with a 2—2.8 μ thick hyaline wall. The latter

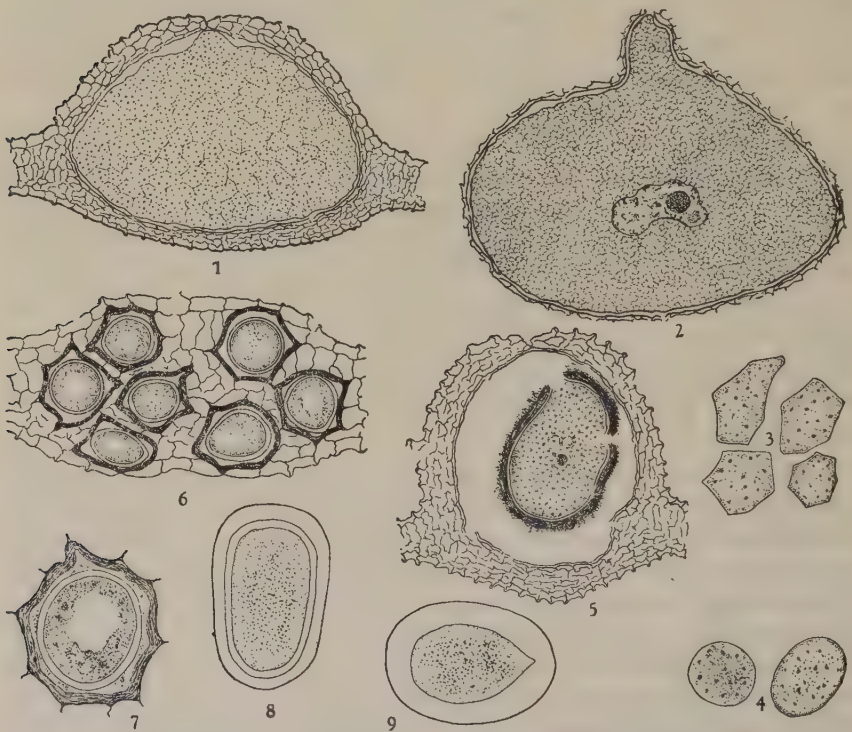

Fig. 1—5. *Synchytrium shuteriae*; fig. 6, 7. *S. dendriticum;* fig. 8, 9. *S. montanum*. Fig. 1. Sporangial gall with sorus of sporangia. × 145. Fig. 2. Unusually large beaked incipient sorus with collapsed primary nucleus. ×145. Fig. 3. Variations in polyhedral sporangia. × 733. Fig. 4. Oval and subspherical sporangia. × 733. Fig. 5. Questionable resting spore gall and spore of *S. shuteriae*. × 145. Fig. 6. Section of leaf with spores in thick-walled cells. × 180. Fig. 7. Enlarged thick-walled cell with oval spore. × 471. Fig. 8, 9. Oval and oblong hyaline bodies found in protuberances on leaves. ×177.

also may appear yellowish-golden from the content of the spore when examined *in toto*. Tobler reported that both the wall of the infected cell and spore are golden-yellow in color, but in the material examined by the author they are hyaline. In fixed and stained sections the content of the spore is not coarsely granular like that of *Synchytrium* spores, and the center is usually occupied by an

have been examined, but in none of them was a large *Synchytrium*-like primary nucleus found.

In view of these differences and characteristics the authors does not regard *S. dendriticum* as a valid member of *Synchytrium.* Fuckel (1866) reported the presence of minute, globose hyaline zoospores, but omitted them in his 1869 diagnosis. He did not describe their origin, size and structure, and it is, therefore, impossible to determine whether or not they are typical of *Synchytrium* zoospores. This fungus may possibly be an endophytic unicellular chytrid like *Olpidium,* or a small spored species of *Protomyces.* However, no unmistakable evidence of a mycelium was found in relation to the spores.

Synchytrium centranthi was collected by Hausknecht on *Centranthus elatus* at Achyrdagh, Marasch in Persia, Mar. 19, 1865, and diagnosed by Rabenhorst as follows: "hypnosporangiis plerumque 3—4 raris singulis, polyedricis, angulis plus minus rotundatis, aurantico fuscis, diam. 0.0213—0.033 mm." The material studied by the author is part of the original collection. No evidence of *Synchytrium* was visible on this material, but some of the leaves and petitioles were covered with white flat blisters which resemble those caused by *Albugo.* However, no spores were found in them. Tobler believed that the hypno-sporangia described by Rabenhorst might be immature sori or sporangia. She found only a few empty galls without sori, sporangia or resting spores in the original material deposited in the Berlin herbarium. In light of Tobler's and the author's observations, it is very doubtful that Rabenhorst's fungus is a species of *Synchytrium.*

Synchytrium bupleuri was collected by J. Kunze on *Bupleurum falcatum* in Saxony and Bohemia and described as a species of *Synchytrium* by Rabenhorst (1873). The author examined specimens of the original material collected by Kunze, Sept. 1872 in Saxony and found no evidence of *Synchytrium.* Several dark spots were present on the leaves, and these contained the mycelium of another fungus. The author thus confirms the observations of Magnus (1874) that this fungus is not a member of *Synchytrium.*

Synchytrium trifolii was collected by Passerini in May, 1877 on *Trifolium pratense* in Italy and described by Rabenhorst (1878) as follows: "sporae globosae, membrana exteriore luteo-fusca levi, interiore alba, gallae hemisphaericae epiphyllae." In 1885 Schroeter referred it to *Olpidium trifolii,* and later Magnus (1902) maintained that it belongs to *Physoderma (Urophlyctis) trifolii.* In a portion of the original material collected by Passerini the author found several large galls filled with resting sporangia of *Physoderma,* a few pustules with spores of a rust and numerous

minute black, necrotic, raised spores which are slightly gall-like in appearance. No evidence of *Synchytrium* was found in the latter spots, and they obviously do not relate to this group of fungi. Inasmuch as *Physoderma* is the most abundant fungus present, the author is inclined to agree with Magnus that Passerini mistook it for a species of *Synchytrium*. At any rate *S. trifolii* should be excluded from the genus as invalid.

Synchytrium groenlandicum was collected by E. Vanhöffen on *Saxifraga cernua* f. *ramosa* at Karajak-Nunatak, Umanakfjord, Greenland, Aug. 17, 1893, and established as a new species by Allescher (1897) who described it as follows: „Wärzchen in unreifem Zustande gelbgrünlich, halbkugelig, am Scheitel etwas niedergedrückt, oft vertieft, ca. 0.2—0.500 mm im Durchmesser. Dauersporen nicht gefunden." Although he was doubtful about its exact identity he was certain that it is a species of *Synchytrium* which resembles *S. mercurialis*. The author examined part of Vanhöffen's original collection in Stockholm and found numerous hyaline to greenish-yellow and greenish-golden protuberances with slight depressed centers which closely resemble galls. These occur abundantly on both surfaces of the leaf, and are usually separate but occasionally confluent and glistening in appearance. Even after thoroughly soaking in water they are extremely hard, and flinty, and include hyaline to yellowish bodies which look and feel like grains of sand. These bodies are oval to elongate and irregular in shape, extremely hard, and are very unlike thalli of *Synchytrium*. In fixed and stained sections of infected leaves such bodies are present in enlarged flattened epidermal cells as well in the palisade and mesophyll tissues. Tobler also studied part of Vanhöffen's collection in Berlin and reported that she found nothing that looked like *Synchytrium* on the host. In light of Tobler's and the present study, *S. groenlandicum* is regarded by the author as invalid.

Synchytrium montanum was collected and described by Zopf (1903) on *Brunella vulgaris* at altitudes of 1500 to 5000 ft. in Tirol, Salzburg and the Black Forest of Germany. He reported that it causes dark-violet to violet-brown, readily visible scattered spots which protrude only slightly above the surface of the epidermis. In each of the epidermal cells occur 1 to 4 egg-shaped or pyriform, 154 μ wide by 176 μ long, resting spores whose content is hyaline and rich in fatty material. The wall also is hyaline and composed of a thick endospore and exospore. The author studied part of the original collection from Innsbruck and found the spots to be as Zopf had described them. However, no *Synchytrium* spores were present in the epidermal cells. Instead, oblong, egg-shaped 96—120 ⇌ 115—140 μ or spherical 80—180 μ hyaline bodies with walls up to 12 μ

thick, and homogeneous hyaline content were found in enlarged epidermal cells as shown in fig. 8 and 9. Apparently, these are the bodies found by Zopf, but they do not relate to *Synchytrium*. Some of them resemble somewhat insect eggs, and others look like cysts of endophytic algae. Similar bodies in almost identical raised spots have been found by the author on numerous species of *Penstemon* from the Pacific northwest states of the U.S.A. Accordingly, if the sample of Zopf's collection which was studied by the author is representative, *S. montanum* is not a valid species.

Summary.

In a study of the original collections of several questionable species of *Synchytrium* at the Riksmuseet in Stockholm, Sweden, *S. shuteriae* was found by the author to be a valid species which appears to be related to members of the subgenus *Woroniella*. No conclusive evidence of *Synchytrium* was found in the herbarium specimens which bear the labels *S. dendriticum, S. centranthi, S. trifolii, S. bupleuri, S. groenlandicum,* and *S. montanum*. In specimens of the first four of these species other fungi instead of *Synchytrium* are present, and in the last two the bodies of spores present relate to other unknown organisms. Accordingly, if the material examined is representative, these six species should be excluded from the genus, in the author's opinion.

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Cumminsina n. gen., eine neue Gattung der Uredineen.

Von F. Petrak (Wien).

Cumminsina Petr. n. gen.

Pycnidia et aecidia ignota; sori uredosporiferi profunde innati, mox erumpentes, sine peridio, sed urophysibus numerosis cylindraceis vel clavato-cylindraceis, introrsum curvatis marginati; uredosporae quoad formam et magnitudinem variae, plerumque ellipsoideae, oblongo-ovoideae vel piriformes, saepe irregulares, subhyalinae vel pallidissime flavo-brunneolae; sori teleutosporiferi plerumque minuti, aterrimi pulverulenti; teleutosporae inter se arte conjunctae, plus minusve crasse clavatae, saepe valde irregulares, in series complures, longitudinaliter parallelas ordinatae, postice in pedicellos compositos, primum subhyalinos vel pallide olivaceos, postea luteo-brunneos transeuntes.

Cumminsina clavispora Petr. n. spec.

Pycnidia et aecidia ignota; uredosori irregulariter et laxe, raro subdense dispersi, plerumque solitarii, raro bini compluresve aggregati vel fere seriatim positi, ambitu orbiculares vel late elliptici, saepe plus minusve irregulares, 70—200 μ diam., raro etiam paulo majores, carneo-flavidi vel flavo-bruneoli, profunde innati, mox erumpentes, urophysibus numerosis, cylindraceis vel clavato-cylindraceis, introrsum curvatis marginati; uredosporae quoad formam et magnitudinem variae, plus minusve angulosae et irregulares, non raro subglobosae, subhyalinae vel pallidissime flavo-brunneolae, episporio ca. 1.5 μ crasso, minute reticulato, 19—30 μ, plerumque ca. 25 μ longae, 13—23 μ plerumque, 15—20 μ latae; sori teleutosporiferi hypophylli, raro et parcissime etiam epiphylli, interdum subgregarii, tunc saepe magnam folii partem aequaliter obtegentes, *Phragmidio* cuidam simillimi, aterrimi, granuloso-pulverulenti, ambitu orbiculares vel elliptici, saepe plus minusve angulosi et irregulares, 0.2—0.5 mm diam., confluendo tantum etiam paulo majores; capitula teleutosporarum non raro etiam in soris uredosporiferis oriundi, quoad formam et magnitudinem variabilissimi, plerumque clavati vel fusoideo-clavati, oblongo-ellipsoidei vel ovoidei, antice late rotundati vel plus minusve truncati, raro plus minusve attenuati, postice paulatim in pedicellos compositos, primum subhyalinos, postea pallide flavo-brunneolos, denique olivaceo-brunneos, 30—90 μ longos, ad basin 10—26 μ crassos transeuntes, sine pedicellis 65—145 μ longi, 30—65 μ

lati, e compluribus, plerumque 3—6 seriebus parallelis, apicem versus plus minusve divergentibus, e cellulis plus minusve isodiametricis, in maturitate fere opace atro-brunneis, arte connatis, subglobosis vel late ellipticis, saepe irregulariter angulosis, 14—23 μ longis, 13—18 μ latis, episporio 1.5—2.5 μ crasso, subhyalino, ubique densissime verruculoso, verrucis conicis, subacuminatis, in vertice usque ad 3.5 μ altis praeditis compositis.

Flecken untypisch und oft auch sehr undeutlich, erst spät erscheinend, rundlich, eckig und oft ganz unregelmässig, zuerst gelbgrünlich, später gelb- oder graubräunlich, ca. 0.3—1 mm im Durchmesser, durch Zusammenfliessen auch noch etwas grösser werdend. Uredosori zuerst erscheinend, wahrscheinlich nur hypophyll, ganz unregelmässig und locker zerstreut, seltener zu zwei oder mehreren, bisweilen auch in grösserer Zahl mehr oder weniger dicht beisammen oder hintereinander stehend, dann oft kurze, meist den Nerven folgende Reihen bildend, im Umriss rundlich oder breit elliptisch, oft mehr oder weniger unregelmässig, sehr verschieden gross, meist ca. 70—200 μ im Durchmesser, selten noch etwas grösser, gelbrötlich oder hell gelbbräunlich, ziemlich stark hervorbrechend, mehr oder weniger konvex vorgewölbt, sich aus einem hyalinen oder subhyalinen, dichten, faserigen, bisweilen auch undeutliche, rundliche, ca. 3—5 μ grosse, dünnwandige Zellen zeigenden Gewebe entwickelnd, welches die Zellen des Mesophylls meist vollständig ausfüllt und bis zur Epidermis der Gegenseite vordringen kann. Die Sori werden am Rande von sehr dicht, fast palisadenförmig nebeneinander stehenden, zylindrischen oder etwas keuligen, stark, meist fingerförmig einwärts gekrümmten, oben oft etwas verbreiterten, sehr breit abgerundeten, hyalinen oder subhyalinen, 30—50 μ langen, 13—23 μ breiten Urophysen *) umgeben. Uredosporen von sehr verschiedener Form und Grösse, ellipsoidisch, länglich eiförmig, an einem Ende zuweilen fast stielförmig vorgezogen, dann birnförmig, oft mehr oder weniger rundlich, nicht selten etwas stumpfeckig, dann ziemlich unregelmässig, hyalin oder hell gelblich, mit ca. 1,5 μ dickem, mit rundlich eckigen, ca. 2—3 μ grossen Netzleisten versehenem Epispor, 19—30 μ, meist ca. 25 μ lang, 13—23 μ, meist 15—20 μ breit. Teleutosori hypophyll, selten und vereinzelt auch epiphyll, meist weitläufig, unregelmässig und locker, bisweilen aber auch dicht zerstreut oder in lockeren Herden auftretend, dann grössere Teile des Blattes ziemlich gleichmässig bedeckend, aber ziemlich locker, habituell einem *Phragmidium* täuschend ähnlich, von feinkörnig pulveriger Beschaffenheit,

*) Diese Bildungen werden in der Uredineen-Literatur stets als „Paraphysen" bezeichnet, haben aber mit den Paraphysen der Askomyzeten n i c h t s zu tun und sollten deshalb auch einen anderen Namen erhalten. Ich glaube, dass man sie am zutreffendsten als **Urophysen** bezeichnen könnte!

schwarz, im Umriss rundlich oder elliptisch, oft etwas eckig und unregelmässig, 200—500 μ im Durchmesser, nur durch Zusammenfliessen auch noch etwas grösser werdend. Nicht selten gelangen auch einzelne Telutosporen in Uredolagern zur Entwicklung.

Teleutosporenköpfchen von sehr verschiedener Form und Grösse, meist mehr oder weniger keulig, oben breit abgerundet oder fast abgestutzt, dann oft von unregelmässig und stumpf dreieckigem Umriss, seltener schwach verjüngt, dann mehr oder weniger spindelig-keulig, zuweilen fast ellipsoidisch oder eiförmig, meist mehr oder weniger scharf und unregelmässig, unten allmählich verjüngt und in den sich abwärts auch noch mehr oder weniger, meist ziemlich stark verjüngenden, ca. 30—60 μ, selten bis ca. 90 μ langen, am unteren Ende 10—26 μ dicken, lange subhyalinen oder hell olivbräunlichen, sich zuletzt aber auch mehr oder weniger dunkel olivbraun färbenden Stiel übergehend, ohne diesen 65—100 μ, selten bis ca. 145 μ lang, 30—50 μ, selten bis ca. 65 μ breit, aus mehreren, meist 3—6, die grössten aber auch mit viel zahlreicheren, senkrecht parallelen, bei den dickeren Köpfchen nach oben mehr oder weniger divergierenden Reihen von rundlichen oder fast ellipsoidischen, oft ganz unregelmässig eckigen, in völlig reifem Zustande fast opak schwarzbraunen, 14—23 ⇌ 13—18 μ grossen, fest miteinander verwachsenen Zellen bestehend, deren ca. 1.5—2.5 μ dickes Epispor auf den Aussenflächen überall mit subhyalinen Warzen besetzt ist, die am Scheitel mehr oder weniger spitz kegelförmig, bis ca. 3.5 μ hoch sind, weiter unten etwas lockerer stehen und kleiner werden. Jede dieser, das Köpfchen zusammensetzenden Zellreihen geht unten in einen aus einer mehr oder weniger isodiametrischen, basalen und einer, seltener aus zwei mehr oder weniger stark gestreckten oberen Zellen bestehenden Stiel über. Diese einzelnen Stiele der Zellreihen sind miteinander fest verwachsen und bilden den zusammengesetzten Stiel des Köpfchens.

Auf lebenden Blättern von *Grewia nenensis*; Angola: Huila Banks of River Nene, near Humpata, ca. 1900 m, 5. VI. 1937, leg. A. W. Exell et F. A. Mendonca.

Diese schöne, sehr interessante, dem bekannten Uredineenforscher, Herrn Prof. Dr. G. B. Cummins zu Ehren benannte Gattung zeichnet sich vor allem durch den sehr eigenartigen Bau der Teleutosporenköpfchen aus, die so aussehen, als ob mehrere *Phragmidium*-Sporen vollständig miteinander verwachsen wären. Von allen bisher bekannt gewordenen Uredineengattungen scheint *Anthomycetella* Syd. in Annal. Mycol. XIV. p. 353 (1916) dem hier beschriebenen Pilz sehr ähnlich zu sein. Die Typusart, *A. canarii* Syd. hat Thirumalachar in Mycologia XXXIX. p. 334—340 (1947) ausführlich beschrieben und abgebildet. Diesem Pilze scheinen besondere Uredolager zu fehlen. Die Teleutosporenköpfchen bestehen hier

aber nur aus zwei Zellschichten. Die Zellen der unteren Schicht sind verkehrt und gestutzt konisch, sitzen unten auf den Stielzellen und tragen oben meist zwei, seltener nur eine, ca. doppelt so lange, zylindrische oder etwas konische, oft sehr unregelmässige Zelle. Das ganze Köpfchen wird von einer dicken, aussen glatten Membran umgeben. Die Sporenköpfchen von *Cumminsina* unterscheiden sich von *Anthomycetella* durch die aus drei oder mehreren, nebeneinander liegenden Reihen von annähernd gleich grossen, meist viel zahlreicheren Zellen bestehenden Köpfchen, die aussen überall, am Scheitel besonders dicht mit spitz kegelförmigen, subhyalinen Warzen besetzt sind.

Es kann wohl keinem Zweifel unterliegen, dass *Cumminsina* auch mit *Ravenelia* verwandt ist, sich davon aber durch den abweichenden Bau der Teleutosporenköpfchen und durch den Mangel der Zysten unterscheidet. Die neue Gattung wird deshalb nach *Anthomycetella* dem Tribus der Ravenelieen eizureihen sein.

Cyphella Musae Junghuhn in insula Trinidad.

Auctore Albert Pilát, Museum Nationale Pragae.

Cum 1 Fig.

A cel. R. W. Denis, Kew, Britanniae specimina *Cyphellae* sp. in insula Trinidad lecta determinationis causa obtinui. Haec species optime cum descriptione et icone *Cyphellae Musae* Junghuhn 1839, ad specimina in monte Merapi Javae insulae altitudine 1400—1700 m lecta convenit. Species commemorata post Junghuhnum in orbe terrarum iterum adhuc non observata est, qua de causa descriptionem speciminum in insula Trinidad collectorum attuli. Probabiliter distributionem pantropicam habet et ad folia et caules plantarum monocotyledonearum occurrit.

Cel. Dr. R. A. Maas Geesterano, curatori Rijksherbarii Hollandici in Leiden, qui mihi tabulam ex opere Junghuhnii et copiam descriptionis originalis arte photographica depictam misit, gratias ex animo ago. Descriptio speciminum ex insula Trinidad:

Cyphella Musae Junghuhn, Praemissa in floram cryptogamicam Javae insulae, Fasc. 1. Verhandelingen van het Bataviaasch Genootschap van Kunsten en Wetenschappen XVII: (1)—(86), t. V, fig. 15, 1839. — Saccardo, Sylloge fungorum 6: 681, 1888. — Non *Cyphella Musae* Oudemans = *Cyphella Oudemansii* Saccardo, Sylloge fungorum 6: 681, 1888.

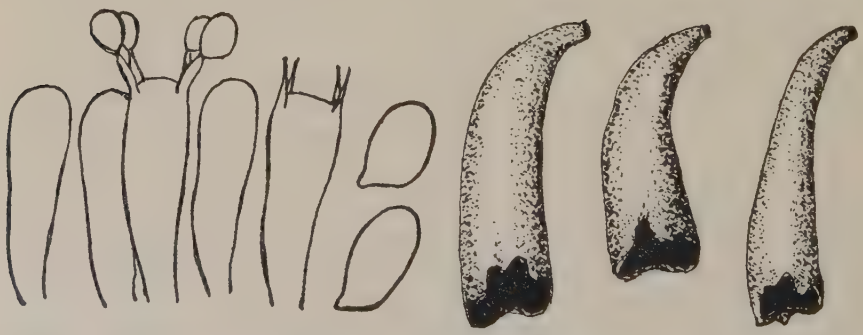

Fig. 1. *Cyphella Musae* Jungh. — Tria carposomata, basidia, et sporae magnif. — A. Pilat ad nat. del.

Carposomata laxe gregaria vel subsolitaria, 1.5—2 mm longa, apice 0.7 mm lata, cum stipite solum 0.2 mm crasso, viva pallide citrina, exsiccata pallide ochracea, saepe paulum brunnescentia et

subcontracta, viva membranaceo-carnosa, anguste conico-cupulata, breviter stipitata, angulum rectum cum stipite ad folia emortua insidentem efformantia. Margo cupulae profunde laciniatus, sed non involutus. Latus exterius laeve glabrumque. Pàries cupulae tenuis, e hyphis plus minusve paralleliter intricatis, tenuiter tunicatis et in solutione KOH 7—11 μ crassis constat. (D e n i s hyphas usque 10—15 μ crassas observavit). Subhymenium indistinctum et conglutinatum. Basidia clavata, hyalina, tetraspora, 16—20 ⇌ 5.5—7.5 μ magna. Sporae hyalinae, laeves. Specimina pro dolor iuvenilia sunt, qua de causa solum parcas sporas observavi. Sporae immaturae, ad basidia insidentes, globoso-ovoideae sunt et ca. 4 μ diam. metiunt. In preparato ex uno carposomate solum duas sporas late ovoideas, apiculo magno subexcentrico provisas et 6—6.5 ⇌ 3.6—4 μ magnas observavi. In preparato e carposomate secundo sporas ellipsoideas, apiculo distincto provisas, 7.5—9 ⇌ 4—4.5 μ magnas inveni. D e n i s tres sporas ellipsoideas, apiculo obliquo provisas et 11—15 ⇌ 5.5 μ magnas observavit. Haec sporae probabiliter adventiciae erant, cum fungus basidia relativiter parva habet. Cystidia nulla, solum ad marginem unae cupulae cystidiola (?) parca, conico-lageniformia, tenuiter tunicata et hyalina, 22—35 ⇌ 5—7.5 μ magna observavi.

Hab. ad folia emortua *Anthurii Huegelii* in insula Trinidad: Cesso del Aripo, 23. X. 1949, cel. R. W. D e n i s legit (No. 218). Speciem forma cupularum et colore valde insignem primum cel. J u n g h u h n in silvis montis Merapi, 4—5000 pedes altitudinis, in insula Java ad truncos *Musae paradisiacae* inhabitantem collegit.

Phacostromella n. gen., eine neue Gattung der Phomopsideen.

Von F. Petrak (Wien).

Phacostromella Petr. n. gen.

Stromata dispersa, cortici omnino innata, peridermio plus minusve tecta, ambitu plus minusve orbicularia vel late ellipsoidea, saepe plus minusve angulosa et irregularia, pulvinata vel applanato-verrucosa, in maturitate irregulariter disrumpentia, denique plerumque late aperta, hypostromate plus minusve crasso, hyalino vel pallide flavido, pseudoparenchymatico, cortici omnino innato praedita, nunc e loculis compluribus, disjunctis, quoad formam et magnitudinem variabilibus, majoribus saepe incomplete loculatis composita, nunc e loculo unico maximo, irregulariter et incomplete sinuato-loculato constantia; conidia acrogena, fusoideo, recta vel inaequilatera, raro curvula, continua, hyalina; conidiophora totam loculorum superficiem interiorem obtegentia, densissime stipata, filiformia, inaequaliter ramosa, sero mucosa.

Fruchtkörper zerstreut, dem Rindenparenchym eingewachsen, aus rundlichem, breit elliptischem, oft etwas stumpfeckigem Umriss polster- oder flach warzenförmig, bei der Reife am Scheitel unregelmässig aufreissend, zuletzt oft weit geöffnet, mit mehr oder weniger dickem, hyalinem oder nur sehr hell gelblich gefärbtem, pseudoparenchymatischem, dem Rindenparenchym eingewachsenem Basalstroma, entweder aus mehreren, oft unvollständig gekammerten Lokuli zusammengesetzt oder nur einen einzigen, sehr grossen, besonders oben und unten durch viele oft weit vorspringende Wandfalten reich aber unvollständig gekammerten Konidienraum enthaltend. Konidien akrogen, spindelförmig, gerade, selten ungleichseitig oder schwach gekrümmt, hyalin, einzellig, $13.5 \rightleftharpoons 4\ \mu$; Konidienträger die ganze Innenfläche der Lokuli bedeckend, sehr dicht stehend, ziemlich lang und kräftig, reichästig, spät verschleimend.

Phacostromella coronata (Fuck.) Petr. comb. nov.

Syn.: *Cryptosporium coronatum* Fuck., Symb. Myc. p. 193 (1869).

Fruchtkörper weitläufig, ziemlich gleichmässig und locker, seltener dicht zerstreut, oft ganze Äste mit allen Seitenästen mehr oder weniger gleichmässig überziehend, einzeln, seltener zu zwei oder mehreren etwas dichter beisammen stehend, dann oft etwas verwachsen, sich unter dem Periderm auf dem Rindenparechym entwickelnd, aus rundlichem oder breit elliptischem, oft etwas stumpfeckigem,

dann mehr oder weniger unregelmässigem Umriss polster- oder flach warzenförmig, 0.5—2.5 mm im Durchmesser, 200—600 μ hoch, meist jedoch nur sehr schwach konvex vorgewölbt, das nur locker anhaftende Periderm bald zersprengend, schollig abwerfend und am Scheitel mehr oder weniger frei werdend, bei der Reife unregelmässig aufreissend und zuletzt weit, oft fast bis zum Rande geöffnet. Unten ist ein bald nur ziemlich schwach zuweilen aber auch sehr kräftig entwickeltes, ca. 80—200 μ, seltener bis ca. 350 μ dickes Basalstroma vorhanden, das dem Rindenparenchym eingewachsen, von mehr oder weniger zahlreichen, ganz unregelmässigen, Hohlräumen unterbrochen und mit grösseren oder kleineren, meist in parallel zur Oberfläche liegenden, ganz verschrumpften Substratresten durchsetzt ist. Es besteht aus einem der Hauptsache nach pseudoparenchymatischen Gewebe von ganz unregelmässig eckigen, mehr oder weniger isodiametrischen, seltener auch etwas gestreckten, hyalinen oder nur sehr hell gelblich gefärbten Zellen und löst sich schliesslich in reich verzweigte, zartwandige, entfernt septierte, hyaline, 3—5 μ breite Hyphen auf. Die ca. 35—50 μ dicke Wand hat eine weiche, fast fleischige Beschaffenheit und besteht aus zahlreichen Lagen von ziemlich dickwandigen, stark zusammengepressten, ca. 8—12 μ grossen, sehr hell gelbbräunlich, in dickeren Schichten hell rostbraun gefärbten Zellen. Manche Fruchtkörper enthalten mehrere, sehr verschieden, meist ca. 150—700 μ grosse, niedergedrückt rundliche oder ellipsoidische, oft unregelmässig und unvollständig buchtig gekammerte Lokuli, während andere nur einen einzigen, mehr oder weniger stark niedergedrückten, ganz unregelmässigen Konidienraum enthalten, der durch zahlreiche, mehr oder weniger weit vorspringende Wandfalten unvollständig gekammert ist. Konidien akrogen, kurz spindelförmig, beidendig stumpf, mehr oder weniger, unten oft etwas stärker verjüngt, dann oft etwas keulig, gerade, selten ungleichseitig oder schwach gekrümmt, mit undeutlich und locker körnigem Plasma, einzellig, hyalin, 10—17 μ, meist ca. 12—15 μ lang, 3—4.5 μ breit. Konidienträger die ganze Innenfläche der Lokuli überziehend, sehr dicht stehend, ziemlich derb fädig, nur die kürzesten einfach, die längeren mit mehr oder weniger zahlreichen Seitenästen, oft fast besenartig verzweigt, ca. 30—45 μ lang, unten 2—3 μ breit, spät verschleimend.

In Sitzb. Ak. Wiss. Wien, Math.-nat. Kl. CXXV p. 103—110 (1916) hat v. Höhnel gezeigt, dass *Cryptosporium* Sacc. non Kunze eine arge Mischgattung ist, in die von den Autoren sehr verschiedene, miteinander gar nicht verwandte Pilze gestellt wurden. Der genannte Autor hat auch ein Exemplar der in den Fung. rhen. unter Nr. 102 verteilten Originalkollektion von *Cryptosporium coronatum* Fuck. untersucht, über das er sich l. c. p. 104 mit folgenden Worten ge-

äussert hat: „*Cryptosporium coronatum* Fuckel ist ein aus Rindenrissen hervorbrechender, steriler, hyaliner, lockerer Hyphenfilz, der aussen offenbar durch Saftfluss schleimig verbunden ist und hier spärlich hyaline, spindelförmige, gerade, einzellige, 15—21 ⇌ 4—6 µ grosse Sporen eingemischt zeigt, die mit anderen Sporen nur zufällig anflogen. Diese Art ist völlig zu streichen."

Das von Höhnel untersuchte Exemplar des *C. coronatum* war offenbar ganz unbrauchbar. Ich habe aber auf mehreren Exemplaren von Fuckel's Fung. rhen. Nr. 102 eine schön entwickelte, Fuckel's Beschreibung entsprechende, vom Gattungstypus *Cryptosporium atrum* Kze. allerdings ganz verschiedene, von mir auch reichlich bei M. Weisskirchen gefundene Phomopsidee gefunden, die mit *Phacostroma* Petr. nahe verwandt, davon aber doch so sehr verschieden ist, dass sie als Typus einer neuen Gattung aufgefasst werden muss. Die oben mitgeteilte Beschreibung wurde nach der Originalkollektion Fuckel's entworfen.

Phacostromella unterscheidet sich von *Phomopsis* vor allem durch die sehr grossen, meist reich gekammerten Stromata, durch die fast fleischige Beschaffenheit des Stromagewebes, durch relativ grössere Konidien, ganz besonders aber durch die reichästigen Konidienträger. Die in bezug auf die Konidien und Konidienträger ähnliche Gattung *Phacostroma* ist durch ihren typisch melanconioiden Bau und durch das mächtig entwickelte senkrecht prosenchymatische Basalstroma von *Phacostromella* leicht zu unterscheiden.

Der zu *Ph. coronata* gehörige Schlauchpilz soll nach Fuckel l. c. die in seiner Gesellschaft wachsende *Cryptospora populina* Fuck. sein. Dieser Pilz ist sicher sehr selten und auch nicht leicht zu finden. Er war auf einer vo mir untersuchten Originalkollektion von Fuckel's Fung. rhen. Nr. 2004 nur in ganz unreifem Zustande vorhanden, dürfte aber wohl mit der von mir in Annal. Mycol. XXXVIII. p. 344 (1940) als *Cryptosporella populina* (Fuck.) Sacc. kurz beschriebenen Kollektion identisch sein.

Mykologische Bemerkungen.

Von F. Petrak (Wien).

In den Jahren 1919—1941 habe ich unter dem Titel „Mykologische Notizen" in den Annales Mycologici die Ergebnisse zahlreicher Einzeluntersuchungen und Beschreibungen neuer Arten veröffentlicht. Als Fortsetzung dieser Notizen sollen jetzt unter obigem Titel verschiedene, sich bei meinen Studien ergebende Tatsachen in kürzester Form mitgeteilt und einzelne Diagnosen neuer Arten veröffentlicht werden. Da mir die mykologische Literatur jetzt nur in beschränktem Umfang zur Verfügung steht, kann es vorkommen, dass die eine oder andere dieser „Bemerkungen" sich bereits als überholt erweist. Ich bin selbstverständlich weit davon entfernt, die Prioritätsrechte anderer Autoren schmälern zu wollen und werde mich in solchen Fällen nur darüber freuen dass meine Feststellungen von anderer Seite schon vor mir als richtig erkannt wurden.

1. *Puccinia asperulae-aparines* Picb. in Prace Mor. Spol. Brno, IV p. 492 (1927). — Damit ist die gleichnamige, von Gäumann in Ber. Schweiz. Bot. Ges. XLVIII. p. 320 (1938) beschriebene Art identisch.

2. *Puccinia cirsii* Lasch. — Auf absterbenden Blättern von *Cirsium esculentum* ssp. *caucasicum.* Transkaukasien; Prov. Tiflis: Achalkalaki, 2. X. 1919, leg. W. Kozlovsky. — Ähnlich wie bei *Puccinia centaureae* Mart., stimmen auch die auf verschiedenen *Cirsium*-Arten vorkommenden *Puccinia*-Formen nicht völlig überein. Von mehreren Formen der *P. cirsii* auf *Cirsium oleraceum, C. heterophyllum* und *C. spinosissimum,* die ich mit dem kaukasischen Pilze verglichen habe, unterscheidet sich dieser durch etwas grössere, wohl auch dunkler gefärbte, 28—43 μ lange, 23—30 μ breite Sporen.

3. *Puccinia saussureae* Thüm. — Auf lebenden Blättern von *Saussurea darwassica* (Winkl.) Lipsky; Turkestan; Darwass: Tevildara, 6000 ft. 28. VIII.—9. IX. 1881, leg. A. Regel. — Stimmt mit der typischen Form auf *Saussurea glomerata* sehr gut überein und unterscheidet sich davon nur durch etwas grössere, 34—50 μ lange, 23—30 μ breite, etwas dunkler gefärbte Sporen.

4. *Uromyces Teodorescui* Rayss in Honn. Prof. Teodoresco, Bucuresti p. 10 (1937). — *U. shahrudensis* Petr. in Sydowia III. p. 273 (1949) würde sich von der Beschreibung des *U. Teodorescui* nur durch etwas grössere Sporen unterscheiden, ist aber damit wohl sicher identisch.

5. *Didymella Mutisiana* Unam. in Bol. Soc. Espan. Hist. Nat. XXXII. p. 443 (1932). — Damit ist der von mir in Denkschr. Akad. Wiss. Wien, CV. p. 9 (1943) als *Didymella cretica* Petr. beschriebene Pilz identisch.

6. *Dimerosporium barnadesiae* Pat. in Bull. Soc. Myc. Fr. p. 148 (1893). — Ist nach einer kleinen Probe des Originalexemplares aus dem Herbarium Sydow eine *Schiffnerula,* die **Sch. barnadesiae** (Pat.) Petr. comb. nov. zu heissen hat.

7. **Discosphaerina poterii** Petr. n. spec. — Perithecia irregulariter et laxe dispersa, plerumque solitaria, raro 2—3 plus minusve aggregata subepidermalia, depresso-globosa vel late ellipsoidea, 100—150 μ, raro usque ad 170 μ diam., primo clausa, postea poro irregulariter anguloso, 15—20 μ lato aperta; mycelium ex hyphis laxe ramosis, breviter articulatis, saepe quasi repentibus, olivaceis, usque ad 10 μ crassis compositum; pariete membranaceo, contextu pseudoparenchymatico, e cellulis irregulariter angulosis, tenuiter tunicatis, pellucide atro-brunneis, vix vel parum compressis, 6—12 μ, raro usque ad 15 μ diam. metientibus composito; asci subnumerosi, rosulati, crassiuscule cylindraceo-obclavati, antice late rotundati vel subtruncati, postice subito contracti, subsessiles, crasse tunicati, 8-spori, p. sp. 28—40 ⇌ 10—13 μ; sporae plus minusve distichae, clavato-oblongae vel subfusoideae, utrinque obtusae et leniter, postice saepe magis attenuatae, rectae vel inaequilaterae, raro curvulae, continuae, hyalinae, 9—13 ⇌ 3—4.5 μ; paraphysoides paucae, ad ascorum basin tantum conspicuae, mox omnino mucosae.

Auf dünnen Stengeln von *Sanguisorba minor;* Mähr.-Weisskirchen: am Südhang des Svrčow, VI. 1937, leg. F. Petrak.

Auf dem vorliegenden Material ist die zugehörige, schon ganz überreife Nebenfruchtform *Selenophoma poterii* (Fautr.) Petr. in Annal. Mycol. XXII. p. 136 (1924) reichlich, der oben beschriebene Schlauchpilz aber nur sehr spärlich vorhanden und meist ziemlich jung.

8. *Dothidella dalmatica* Picb. in Prace Mor. přírod. Spol. Brno, VII. 12, Sign. F, 66, p. 2 (1932). — Ist nach einem, mir vorliegenden Originalexemplare eine *Mycosphaerella,* deren Perithezien in sehr dichten, scharf begrenzten Herden wachsen: **Mycosphaerella dalmatica** (Picb.) Petr. comb. nov.

9. **Karstenula mezerei** Petr. n. spec.

Syn.: *Pleospora mezerei* Petr. in sched. 1924.

Perithecia irregulariter, laxe vel subdense dispersa, saepe bina complurave plus minusve aggregata, in cortice nidulantia, globosa vel late ellipsoidea, vix vel parum depressa, 300—400 μ diam., ostiolo papilliformi, primo clauso, postea poro irregulariter rotundato ca. 25 μ

lato aperta et punctiformiter erumpentia; pariete membranaceo 20—35 μ crasso, contextu pseudoparenchymatico, e cellulis irregulariter angulosis, vix vel leniter compressis, crassiuscule tunicatis, atro-brunneis, 6—15 μ diam. metientibus composito, extus cum reliquiis matricis omnino vietis connato et hyphis numerosis, laxe ramosis, indistincte et remote septatis, sordide carmineis vel violaceo-carmineis, pro ratione crassiuscule tunicatis, 3.5—4.5 μ crassis dense obtecto; asci numerosi, cylindracei, antice late rotundati, postice in stipitem crassiusculum ca. 20—40 μ longum attenuati, crasse tunicati, 8-spori, p. sp. 95—120 ⇌ 9—11 μ; sporae arte monostichae, oblongae vel ellipsoideae, utrinque late rotundatae, non vel distincte attenuatae, tunc subfusoideae, rectae, raro inaequilaterae, 3-raro 4-septatae, medio plus minusve, ceterum vix constrictae, loculo quodam centrali interdum septo longitudinali diviso, obscure melleae vel pallide olivaceae, 13—19.5 μ, plerumque 14—17 longae, 6—9 μ latae; paraphyses numerosissimae, tenuiter fibrosae, simplices vel laxe ramosae, ca. 1.5 μ crassae, sero viescentes et mucosae.

Auf dürren, am Strauche noch hängenden Ästchen von *Daphne mezereum;* Mähr.-Weisskirchen: obere Höllenschlucht bei Podhorn, III. 1923, leg, F. Petrak.

Die in einen dichten, schmutzig karminroten Hyphenfilz eingehüllten Perithezien dieses Pilzes brechen meist nur mit dem papillenförmgen Ostiolum punktförmig hervor, können aber zuweilen auch am abgeflachten Scheitel etwas frei werden. Am Rande desselben ist das Periderm durch die Hyphen des Pilzes oft mehr oder weniger rötlich verfärbt.

10. **Lembosia schizospora** (A. Zahlbr.) Petr. comb. nov.

Syn.: *Micrographa schizospora* A. Zahlbr.

Anlässlich einer Revision der im Herbarium der Botanischen Abteilung des Naturhist. Museums in Wien vorhandenen Flechten hat Herr Dr. R. Santesson diese *Micrographa* Zahlbruckner's als „Fungus non lichenisatus" bezeichnet. Die Untersuchung des äusserst dürftigen unter jeder Kritik schlechten Materiales zeigte mir, dass dieser Pilz eine asterinoide *Lembosia* ist, die *Lembosia schizospora* (A. Zahlbr.) Petr. zu heissen hat. Es sind nur einige, meist ganz zerfallene oder unreife, eine meist ganz verdorbene Fruchtschicht zeigende Fruchtkorper vorhanden, deren opak schwarzbraune Deckschicht in ein ca. 20—60 μ breites, aus radiär-parallelen, durchscheinend schwarzbraunen Hyphen bestehendes, fransig-ausgezacktes Randhäutchen übergeht. Myzelhyphen ziemlich gerade, locker verzweigt, etwas wellig gekrümmt, mit polsterförmigen, ca. 4—16 μ breiten, 9—11 μ hohen, ganzrandigen, vorne flach konvexen oder etwas ausgerandeten Hyphopodien, ziemlich dickwandig, ca. 5—6.5 μ dick, Aszi in geringer Zahl, breit eiförmig oder ellipsoidisch,

ca. 80 ⇌ 65 μ gross. Sporen zusammengeballt, länglich, beidendig breit abgerundet, unten oft schwach verjüngt, gerade oder ungleichseitig, in der Mitte septiert, mehr oder weniger tief eingeschnürt, hyalin, sich schliesslich durchscheinend schwarzbraun färbend, 35—40 ⇌ 15—20 μ; Paraphysoiden zahlreich, faserig-zellig.

Die reiferen, mehr oder weniger dunkel gefärbten Sporen sind stets mehr oder weniger verschrumpft; dass sie teilweise in die beiden Hälften zerfallen sind, ist sicher kein spezifisches Merkmal, sondern nur eine Folge des ungemein schlechten Entwicklungszustandes dieses Pilzes.

11. *Leptosphaeria capparidicola* Mundk. et Ahmad, Myc. Pap. Comm. Myc. Inst. Kew, Nr. 18, p. 4 (1946). — Nach der Beschreibung und Abbildung ist das Originalmaterial dieses Pilzes schlecht entwickelt, was durch die an der Querwand stark eingeschnürt und etwas verschrumpft gezeichneten Sporen bewiesen wird. Damit ist *Leptosphaeria Ahmadii* Petr. in Sydowia VIII. p. 167 (1954) identisch.

12. *Micropeltis carniolica* Rehm in Hedwigia, 1892, p. 307. — Von diesem Pilze konnte ich mehrere Exemplare der in Rehm's Ascom. exs. unter Nr. 1078 ausgegebenen Kollektion untersuchen, aber nur ganz alte, morsche Perithezien ohne Fruchtschicht finden. Die Perithezien sitzen ganz vereinzelt oder sehr locker zerstreut auf einem mehr oder weniger ausgebreiteten, zarthäutigen Subikulum. Dasselbe ist meist hyphig gebaut und besteht dann aus ziemlich dünnwandigen, hell gelbbräunlichen oder honiggelben, oft zu zwei oder mehreren parallel nebeneinander verlaufenden, kurzgliederigen, ca. 4—6 μ breiten Hyphen. Nicht selten wird es aber auch fast pseudoparenchymatisch und besteht dann teils aus isodiametrischen, ca. 5—10 μ grossen, teils aus mehr oder weniger gestreckten, bis 14 μ langen, 4—6 μ breiten, etwas dickwandigeren und dunkler gefärbten Zellen. Die rundlichen, am Scheitel mehr oder weniger schüsselförmig eingesunkenen Gehäuse sind ca. 130—200 μ gross; ihre Membran hat eine häutige, wohl infolge des Alters etwas brüchige Beschaffenheit und besteht aus rundlich eckigen, ziemlich dünnwandigen, 6—13 μ grossen, ziemlich dunkel kastanienbraunen Zellen. Nach Rehm sollen die Aszi 36—45 μ lang, 15 μ breit, die Sporen 16—22 ⇌ 5 μ gross, hyalin und mit 3 Querwänden versehen sein. Wie aus der hier mitgeteilten Beschreibung klar hervorgeht, hat dieser Pilz mit den Micropeltineen nichts zu tun, ist eine typische Chaetothyriee, entspricht der Gattung *Limacinia* und wäre als **L. carniolica** (Rehm) Petr. comb. nov. einzureihen, wenn man diese Gattung neben *Chaetothyrium* aufrecht halten will, von dem sie sich nur durch das kahle Myzel und die borstenlosen Perithezien unterscheidet.

13. *Mycosphaerella allicina* (Fr.) Vestergr. — Auf abgestorbenen Blättern von *Phyllodoce coerulea*. Norwegen; Tromsö: Flöifjeld, 30. IV. 1888, leg. C. Baenitz. — Diese Kollektion weicht von den gewöhnlichen Formen der *M. allicina* in mancher Beziehung ab. Die wohl nur epiphyll wachsenden Perithezien sind unregelmässig und ziemlich dicht zerstreut, bisweilen zu zwei oder mehreren gehäuft, kaum oder schwach niedergedrückt rundlich, mit flachem, stumpf konischem oder papillenförmigem Ostiolum, oben fast klypeusartig mit der etwas pustelförmig vorgewölbten Epidermis verwachsen. Aszi zylindrisch, unten meist nur schwach sackartig erweitert. Sporen länglich keulig oder fast spindelig, 16—22 ⇌ 6—7 µ. Paraphysoiden ziemlich zahlreich, von faserigem, über den Schläuchen mehr oder weniger dichtzelligem Gewebe.

14. *Mycosphaerella thujae* Petr. ap. Syd. et Petr. in Annal. Mycol. XX. p. 179 (1922). — Obwohl ich die Sporen dieser Art nur 14—16 ⇌ 3.5—4.5 µ gross gefunden habe, glaube ich doch, dass sie mit *Sphaerella canadensis* E. et E. North Amer. Pyrenom. p. 280 (1892) identisch sein wird, weil das mir vorliegende Material noch sehr jung zu sein scheint.

15. *Phyllachora eragrostidis* Auct. — Unter diesem Namen wurden in den letzten Jahren offenbar zwei verschiedene Arten beschrieben, von denen die eine in Südamerika, die andere in Afrika und Asien gefunden wurde. Es ergibt sich folgende Synonymie:

Phyllachora eragrostidicola Doidge in Bothalia, IV. p. 865 (1948). — Syn.: *Ph. eragrostidis* Doidge l. c. IV. p. 425 (1942). — *Ph. eragrostidis* Petr. in Medd. Göteb. Trädg. XVII. p. 139 (1947). — Sporen 12—15 ⇌ 6—8 µ.

Phyllachora eragrostidis Chardon in Bol. Soc. Venez. Cien. Nat. V. Nr. 40. p. 351 (1939). — Syn.: *Ph. eragrostidis* Viegas in Bragantia IV. p. 75 (1944). — Sporen 10—13 ⇌ 4.5—6 µ.

16. *Phyllachora acalyphae* Chard. in Mycologia, XXXII. p. 189 (1940). — Mit dieser Art ist *Ph. pichinchae* Petr. in Sydowia II. p. 357 (1948) identisch.

17. *Sphaerella Antoniana* Unam. in Bol. Real Soc. Espan. Hist. Nat. XXX. p. 210 (1930) und *Sph. euphorbiae-exiguae* Unam. l. c. p. 383 (1930) sind nach den Beschreibungen nur Matrixformen der *Mycosphaerella allicina* (Fr.) Vesterg.

18. *Sphaerodothis calospora* Syd. in Annal. Mycol. XXII. p. 302 (1924). — Von dieser Art konnte ich die beiden Kollektionen G. H. Cunningham's, Nr. 1028 und 1053 auf *Danthonia pilosa* untersuchen und feststellen, dass *Sph. magnifica* Petr. in Sydo-

wia I. p. 265 (1947) auf *Triodia pumila* damit völlig identisch ist. Im Zustande völliger Reife sind die Sporen dieses Pilzes fast opak schwarzbraun.

19. *Sphaerulina maroccana* G. Frag. in Bol. Soc. Esp. Hist. Nat. 1917, p. 81. — Ist nach der Beschreibung mit *Pseudoplea trifolii* (Rostr.) Petr. identisch. *Ascochyta trifolii* Bond. et Truss., die eine Nebenfruchtform von *Sph. maroccana* sein soll, ist sicher nur eine Matrixform von *Stagonospora meliloti* (Lasch) Petr.

20. **Spilosticta hellebori** (Rehm.) Petr. comb. nov. —

Syn.: *Asterina hellebori* Rehm ap. Voss in Verh. Zool. Bot. Ges. Wien, 1887, p. 213, Tab. V, fig. 3. — *Asterella hellebori* Sacc. Syll. IX. p. 398 (1891). — Auf absterbenden und dürren Blättern von *Helleborus cyclophyllus*. Nord-Euboea: Xiron-Oros bei Hagios, VI. 1955, leg. K. H. Rechinger. — Ist eine typische *Spilosticta,* die hier nach dem zahlreichen, prächtig entwickelten Material etwas ausführlicher beschrieben werden soll: Perithezien in rundlichen, bis ca. 4 mm Durchmesser erreichenden, nur epiphyll auftretenden, dichten Herden wachsend, schwärzliche oder grauschwärzliche Verfärbungen verursachend, subepidermal eingewachsen, rundlich oder ellipsoidisch, kaum oder schwach, bisweilen auch ziemlich stark niedergedrückt, 70—100 µ, selten bis ca. 130 µ im Durchmesser, mit ganz flachem, sich erst spät durch einen rundlichen, ca. 20 µ weiten Porus öffnendem Ostiolum, dessen Rand zuweilen mit einigen, ganz flach niederliegenden, stumpf zugespitzten, ziemlich geraden oder schwach wellig gekrümmten, bis ca. 35 µ langen, 3—5 µ breiten, fast opak schwarzbraunen Borsten besetzt ist. Peritheziummembran häutig, ca. 6—12 µ dick, aus unregelmässig eckigen, mehr oder weniger zusammengepressten, unten und an den Seiten hell olivbraunen, ca. 6—12 µ grossen, am Scheitel fast opak schwarzbraunen, ungefähr um die Hälfte kleineren Zellen bestehend. Aszi ziemlich zahlreich, zylindrisch-keulig, oben breit abgerundet, fast sitzend oder sehr kurz knopfig gestielt, derb- und dickwandig, 8-sporig, p. sp. 35—50 ⇌ 6.5—8 µ; Sporen unvollständig zweireihig, länglich-keulig, beidendig stumpf, unten schwach, aber meist deutlich, seltener kaum verjüngt, dann fast ellipsoidisch, gerade, selten ungleichseitig, etwas unterhalb der Mitte, vereinzelt fast im unteren Drittel septiert, kaum eingeschnürt, subhyalin, in völlig reifem Zustande hell graugrünlich, 10—13 ⇌ 4.5—6.5 µ; Paraphysoiden ziemlich zahlreich, faserig, bald stark verschleimend.

In Annal. Mycol. X. p. 194 (1912) äussert sich Theissen über diesen Pilz mit den Worten: „Ist eine Sphaeriacee mit kohligen, parenchymatisch gebauten, nicht radiären, tief in die Epidermis ein-

gelassenen Gehäusen. Das ist ganz unrichtig! Die häutigen Perithezien entwickeln sich nämlich unter der Epidermis und sind dem Mesophyll tief eingewachsen.

21. **Sporormia disjuncta** (Ahmad) Petr. comb. nov. — Syn.: *Lasiosphaeria disjuncta* Ahmad in Sydowia, VII. p. 267 (1953). — Dieser Pilz ist nach einer mir vorliegenden Probe der Originalkollektion eine sehr interessante *Sporormia*, die sich von den typischen Arten der Gattung durch die sich in einem dichten Hyphenfilz entwickelnden, aussen überall dicht mit diesen Hyphen bekleideten Perithezien und durch die auf einem sehr dicken, stark konvex in den Hohlraum des Gehäuses hineinragenden, hyalinen Gewebspolster entspringenden Aszi unterscheidet. Weil die Perithezien der meisten *Sporormia*-Arten mit mehr oder weniger zahlreichen, wenn auch nicht so langen und dicht stehenden, borstigen Hyphen besetzt sind, kann der mir vorliegende Pilz nicht als von *Sporormia* generisch verschieden erachtet werden und wird als *Sp. disjuncta* (Ahmad) Petr. einzureihen sein. Nachstehend lasse ich noch einige Ergänzungen zu der vom Autor mitgeteilten Beschreibung folgen:

Perithezien ca. 350—500 μ gross, in dichten Herden wachsend, rundlich oder rundlich eiförmig, oben in ein kegelförmig-zylindrisches, bis ca. 300 μ langes, in der Mitte 100—130 μ dickes, sehr dicht mit ca. 30—60 μ langen, mehr oder weniger aufwärts gerichteten, stumpfen, meist etwas gekrümmten, olivbraunen, ca. 3—4 μ dicken Borsten, weiter unten überall sehr dicht mit bis ca. 500 μ langen, meist einfachen, seltener etwas ästigen, ziemlich geraden oder nur schwach wellig gekrümmten, schwarzbraunen, etwas dickwandigen, ziemlich entfernt und undeutlich septierten, 4—6 μ dicken, einen dichten, schwarzen Filz bildenden Hyphen besetzt. Peritheziummembran häutig, pseudoparenchymatisch, 35—40 μ, oben bis ca. 50 μ dick, aus ca. 6—12 μ grossen, unregelmässig eckigen, oft etwas gestreckten, dann bis ca. 16 μ langen, aber nur 3—5 μ breiten, aussen bis ca. 10 μ grossen und mehr oder weniger halbkugelig oder fast kugelig vorspringenden, dünnwandigen, schwarzbraunen Zellen bestehend. Von der Basis des Gehäuses ragt ein in der Mitte bis ca. 160 μ dicker, hyaliner, stark konvexer Gewebspolster in den Hohlraum des Peritheziums hinein. Derselbe ist völlig hyalin, besteht unten aus rundlich eckigen, ca. 3—5 μ grossen Zellen, wird aber oben undeutlich faserig und ist sehr dicht mit den zahlreichen, gegen die Seitenwand des Gehäuses stark divergierenden, mit 60—85 μ langen, 3—4 μ dicken Stielen versehenen, ohne diese 85—110 μ langen, 10—13 μ breiten Aszi besetzt. Die sehr zahlreichen, spät verschleimenden Paraphysen sind 1—1.5 μ dick, fädig, teils einfach, teils etwas ästig.

Der schöne, sehr charakteristische Pilz wird am besten als Typus einer neuen Untergattung aufzufassen sein, die auf folgende Weise zu charakterisieren wäre:

Sporormia de Not. subgen.: **Neohormia** Petr. n. subgen.

Perithecia gregaria, hyphis simplicibus vel laxe ramosis, rectiusculis, atro-olivaceis densissime obtecta, ostiolo crasse cylindraceo-conoideo, dense setoso praedita; asci numerosi in pulvinulo basali parietis interioris subhemisphaerico hyalino oriundi.

Perithezien herdenweise, mit etwas verlängertem, zylindrisch-kegelförmigem, dicht mit aufrecht abstehenden, schwarzbraunen Borsten besetztem Ostiolum, aussen überall sehr dicht mit langen, einfachen oder etwas ästigen, ziemlich geraden oder nur schwach gekrümmten, schwarzbraunen, einen schwarzen, dichten Filz bildenden Hyphen besetzt. Aszi sehr zahlreich, auf einem in der Mitte der Basis befindlichen, stark konvex, oft fast halbkugelig vorspringenden, unten kleinzelligen, oben faserigen, hyalinen Gewebspolster entspringend.

22. **Uleomyces dendriticus** Petr. n. spec.

Stroma e centro communi radiato-ramosum, plerumque e funiculis 6—8 rectiusculis vel parum curvulis, 3—8 mm longis, apicem versus iterum iterumque dichotomis, 250—400 μ, raro usque ad 500 μ latis compositum, praecipue in epidermide evolutum; ascomata seriatim in funiculis stromaticis evoluta, ambitu elliptica, raro fere orbicularia, saepe plus minusve irregularia, pulvinata, ca. 180—250 μ lata, primo pariete epidermidis exteriore tecta, eo in maturitate longitudinaliter rupto et revoluto plus minusve denudata; strato tegente ca. 25—40 μ crasso, contextu pseuoparenchymatico, e cellulis irregulariter rotundato-angulosis, ca. 3—5 μ diam. metientibus, amoene sanguineis, pro ratione crassiuscule tunicatis composito; strato ascigero indistincte prosenchymatico, e cellulis subhyalinis vel pallide sanguineis, in series plus minusve verticaliter ordinatis, 3—6 μ longis, pro ratione crassiuscule tunicatis composito; asci mono- vel plus minusve distichi, oblongo-ellipsoidei vel oblongo-ovoidei, crasse tunicati, sessiles- 4—8- raro 2—3-spori, singulatim in strato ascigero oriundi, 30—40 μ, raro usque ad 45 μ longi, 20—30 μ lati; sporae oblongae, oblongo-ellipsoideae vel clavato-oblongae, utrinque rotundatae, vix vel postice tantum lenuiter attenuatae, rectae, raro inaequilaterae vel curvulae, transverse 3—6-plerumque 5-septatae, loculo centrali quodam saepe septo longitudinali diviso, medio leniter vel plerumque manifeste, ceterum non vel vix constrictae, flavidae vel flavo-rubescentes, 18—24 μ, raro usque ad 26 μ longae, 8—11 μ latae.

Auf lebenden Blättern von *Syzygium purpurascens*. Neu-Guinea: Morobe-Distrikt, Wareo, 8. I. 1936, leg. M. S. Clemens.

Uleomyces dendriticus ist eine schöne, durch das eigenartige, dendritisch oder locker eisblumenartig verästelte Stroma sehr ausgezeichnete Art. Von einem gemeinsamen Mittelpunkt entspringen ca. 6—8 schwach vorspringende, sich allmählich wiederholt gabelig teilende Stromastränge, in denen sich zentrifugal die reihenweise hintereinander stehenden Ascomata entwickeln. Diese sind in der Jugend von der intensiv blutrot verfärbten Epidermisaussenwand bedeckt, die bei der Reife durch einen Längsriss zersprengt wird, so dass die schollig-krümelige Oberfläche des Fruchtkörpers entblösst wird. Das unter dem Stroma befindliche Palisadengewebe wird auch schön und mehr oder weniger dunkel blutrot verfärbt. Weiter innen sind im Mesophyll hyaline, sehr zartwandige, 2—3 μ breite, ziemlich kurzgliederige Myzelhyphen vorhanden, die meist einfach, seltener sehr locker verzweigt sind.

23. **Wettsteinina Eliassonii** Petr. n. spec.

Maculae laxe et irregulariter dispersae, amphigenae, ambitu orbiculares vel late ellipticae, saepe plus minusve angulosae et sinuosae, tunc plus minusve irregulares, concentrice et tenuiter zonatae, primo fuscae vel griseo-olivaceae, linea tumidula vix obscuriore bene limitatae, postea centro expallescentes, tunc pallide canescentes vel albidae, 1.5—6 mm diam., non raro binae compluresve aggregatae, tunc plus minusve confluentes, omnino irregulares et multo majores; perithecia in centro macularum plerumque singularia, raro 2—3 laxe dispersa vel etiam plus minusve aggregata, globosa vel ovato-globosa, 250—350 μ diam., raro etiam paulo majora, ostiolo atypico, breviter cylindraceo-conico, antice late rotundato, omnino clauso, usque ad 120 μ alto, 90—110 μ lato, intus contextu pseudoparenchymatico, omnino hyalino, e cellulis irregulariter angulosis, tenuiter tunicatis, ca. 3.5—8 μ diam., metientibus composito repleto punctiformiter erumpentia, hyphis mycelii nonnullis laxe ramosis, pallide olivaceis vel brunneolis, remote septatis, tenuiter tunicatis, 3—6.5 μ crassis praedita; pariete membranaceo, inferne ca. 15—20 μ, ad basin ostioli usque ad 30 μ crasso, contextu pseudoparenchymatico, e cellulis irregulariter angulosis, tenuiter tunicatis, ad basin et ad latera pellucide olivaceis, ca. 8—20 μ diam., metientibus plus minusve compressis, superne fere opace atro-brunneis et plus minusve minoribus composito; asci pauci, plerumque 4—6, crasse clavati vel oblongo-ovoidei, antice latissime rotundati, postice subito contracti, fere sessiles vel brevissime et crassiuscule noduloso-stipitati, crasse tunicati, sed facile diffluentes, 4—8-spori, 180—240 ⇌ 70—110 μ; sporae di- vel incomplete tristichae, oblongae vel clavato-oblongae, utrinque late rotundatae, antice non, postice saepe lenissime et paulatim attenuatae, rectae, rarissime inaequilaterae, immaturae tantum observatae, tunc hyalinae, 4-septatae, plus minusve constrictae, plasmate granuloso

farctae, episporio 4.5—6.5 μ crasso, 80—115 ⇌ 35—45 μ; paraphysoides paucae, fibroso-cellulosae, mox viescentes et mucosae.

Auf lebenden Blättern von *Saussurea alpina* und *Crepis paludosa*. Schweden: Jemtland: Are, Mörviksböcken, 21. VIII. 1930, leg. A. G. Eliasson.

Der hier beschriebene Pilz ist ein typischer Parasit. Dadurch weicht er von allen bisher bekannt gewordenen *Wettsteinina*-Arten, die als Saprophyten auf dürren, vorjährigen Kräuterstengeln und Blättern wachsen, wesentlich ab. In bezug auf Bau und Grösse der Sporen ist er der *W. gigaspora* v. Höhn. sehr ähnlich. Auch bei dieser Art bestehen die Sporen aus einer zweizelligen oberen und einer dreizelligen unteren Hälfte, die durch eine schon sehr frühzeitig gebildete Querwand getrennt werden. Der hier beschriebene Pilz unterscheidet sich aber von *W. gigaspora*, von seiner typisch parasitischen Lebensweise abgesehen, vor allem durch das kräftig entwickelte, weit vorragende, ziemlich dick zylindrisch-kegelförmige Ostiolum.

24. *Ascochyta saponariae* Fuck. Symb. Myc. p. 388 (1869). — Ist nach einer, von mir bei M. Weisskirchen gesammelten Kollektion eine *Asteromella*, deren in sehr dichten Herden wachsende Pykniden, schwärzliche, ziemlich scharf begrenzte Flecken verursachen. Ist daher als **Asteromella saponariae** (Fuck.) Petr. nov. comb. einzureihen.

25. *Blennoria acantholimonis* P. Henn. in Kab. et Bub. Fung. imperf. exs. Nr. 529 (1909) ist, wie schon v. Höhnel in Öster. Bot. Zeitschr. 1916, p. 102 angegeben hat, eine *Ceuthospora*. Damit ist *Ceuthospora acantholimonis* Petr. in Ann. Naturh. Mus. Wien, LII. p. 372 (1942) identisch. Der Pilz muss jetzt als *Ceuthospora acantholimonis* (P. Henn.) v. Höhn. in Mitteil. Bot. Inst. Techn. Hochsch. Wien, II, p. 105 (1925) eingereiht werden.

26. *Macrophoma Brenckleana* Sacc. in Annal. Mycol. XI. p. 316 (1913). — Ist eine typische *Chondroplea*, die der *Ch. populea* (Sacc.) Kleb. nahe steht, aber sicher verschieden ist: **Chondroplea Brenckleana** (Sacc.) Petr. comb. nov. Syn.: *Discula Brenckleana* (Sacc.) Petr. in Annal. Mycol. XXII. p. 139 (1924).

27. *Myxosporium staphyleae* Oud. — Ist nach dem mir vorliegenden Originalexemplar die Nebenfruchtform von *Diaporthe Robergeana* (Desm.) Niessl und mit *Phomopsis Robergeana* (Sacc.) Died. identisch.

28. *Naemosphaeria shastensis* Sprague et W. B. Cooke in Mycologia, XXXI. p. 46 (1939). — Die Untersuchung einer Probe der Originalkollektion, die mir Herr Dr. W. B. Cooke in dankenswerter Weise gesendet hat, zeigte mir, dass dieser Pilz mit *Naemo-*

sphaera (Sacc.) Karst. nichts zu tun hat. Schon v. Höhnel hat in Österr. Bot. Zeitschr. LXVI. p. 103 (1910) darauf hingewiesen, dass die Typusart dieser Gattung eine *Rabenhorstia* ist, die zu *Hercospora magnoliae-acuminatae* (Peck) v. Höhn. gehört und von Höhnel in Mitteil. Bot. Inst. Techn. Hochsch. Wien, III. p. 19 (1926) als *Rabenhorstia magnoliae* (Peck) v. Höhn. bezeichnet wurde. Die Konidien dieses Pilzes sind auch nicht gefärbt, wie in der Literatur angegeben wird, sondern dauernd hyalin. *Naemosphaerella* v. Höhn. mit *N. ceratophora* (Speg.) Petr. et Syd. als Typusart hat dunkel gefärbte Konidien, ist aber, wie aus der Beschreibung von Petrak und Sydow in Fedde's Repert. Beiheft XLII. p. 478 (1927) hervorgeht, von *N. shastensis* ganz verschieden. Dieser Pilz stimmt in jeder Hinsicht mit *Sclerosphaeropsis* Bub. in Ann. Naturhist. Mus. Wien XXVIII. p. 209, Tab. XVI, Fig. 5—7 (1914) überein, deren Typusart *S. heldreichiae* Bub. sich von dem amerikanischen Pilze nur durch etwas kürzere, dafür aber breitere Konidien unterscheidet. *Sclerosphaeropsis* wurde von Petrak und Sydow l. c. p. 327 und 335 als ein Synonym von *Coniothyrium* bezeichnet, weil viele *Coniothyrium*-Arten bald mit dicker, bald mit dünner Pyknidenmembran vorkommen. Die Wandzellen sind aber bei *Sclerosphaeropsis* mehr oder weniger dickwandig, die Pykniden relativ gross und mit einem etwas verlängerten, ziemlich spitz kegelförmigen Ostiolum versehen. Man wird deshalb *Sclerosphaeropsis* neben *Coniothyrium* mit demselben Rechte wie *Plenodomus* neben *Phoma* aufrechterhalten können. *N. shastensis* wird daher als zweite *Sclerosphaeropsis*-Art **Sclerosphaeropsis shastensis** (Sprague et W. B. Cooke) Petr. comb. nov. zu heissen haben.

29. **Papularia bambusina** (Speg.) Petr. comb. nov.

Syn.: *Melanconium bambusinum* Speg. Fung. Guaran. nonnulli nov. vel crit. Nr. 152 (1891); Sacc. Syll. X. p. 474 (1892). — *Melanconium lineolatum* Sacc. in Atti Accad. Ven.-Trent. Istr. X. p. 83 (1917). — *Papularia ecuadorensis* Petr. in Sydowia, V. p. 583 (1950). — Die hier als Synonyme zitierten Pilze sind gewiss nur Substratformen einer einzigen, durch relativ grosse Konidien ausgezeichneten Art.

30. *Phyllosticta excavata* Sacc. in Nuov. Giorn. Bot. Ital. Nuov. Ser. XXVII. p. 80 (1920); Petr. ap. Syd. et Petr. in Annal. Mycol. XXII. p. 394 (1924). — Ist eine typische *Asteromella*, die **A. heucherae** (E. et E.) Petr. zu heissen hat. Als Synonyme gehören hierher noch *Stictochorella heucherae* (E. et E.) Petr. l. c. p. 395 und *Phyllosticta heucherae* Ell. et Ev. in Amer. Natur. 1897, p. 428 nec. Brun. in Act. Soc. Linn. Bordeaux, 1890, p. 57 extr.

31. *Phyllosticta innumera* Cooke et Harkn. in Bull. Calif. Acad. Sci. I. p. 14 (1884). — Ist eine *Asteromella* mit dicht herden-

weise wachsenden Pykniden: **Asteromella innumera** (Cooke et Harkn.) Petr. comb. nov.

32. **Phyllostictina pirolae** (Ell. et Ev.) Petr. comb. nov.

Syn.: *Phyllosticta pirolae* Ell. et Ev. in Journ. Myc. 1889, p. 145.

Flecken vom Blattrande ausgehend, beiderseits sichtbar, aber untypisch, unregelmässig eckig, 2—4 mm im Durchmesser, oft auch etwas gestreckt, nicht oder nur unscharf, bisweilen aber auch durch Nerven scharf begrenzt, dunkelbraun oder schwärzlich. Pykniden epiphyll, unregelmässig locker oder ziemlich dicht zerstreut, oft zu zwei oder mehreren gehäuft, sich in und unter der Epidermis entwickelnd, niedergedrückt rundlich oder breit ellipsoidisch, 120—160 μ im Durchmesser, mit flachem, papillenförmigem, sich durch einen unregelmässig rundlichen, 10—15 μ weiten Porus öffnendem Ostiolum. Myzelhyphen zahlreich, ästig, gerade oder wellig gekrümmt, die dünnen subhyalin, die dickeren hell olivbraun, dickwandig, ziemlich entfernt septiert, 3—10 μ breit. Pyknidenmembran pseudoparenchymatisch, aus unregelmässig eckigen, kaum oder schwach zusammengepressten, 6—15 μ grossen Zellen bestehend. Konidien sehr zahlreich, etwas schleimig verklebt zusammenhängend, von sehr verschiedener Form, breit eiförmig oder ellipsoidisch, oft fast kugelig, sehr oft stumpfeckig und dann mehr oder weniger unregelmässig, hyalin, einzellig, mit ziemlich grobkörnigem Plasma, 4—6 μ im Durchmesser oder 5—7 μ lang, 4—5 μ breit. Konidienträger die ganze Innenfläche der Wand überziehend, kurzfädig, einfach, 5—10 ⇌ 1.5 μ, bald verschrumpfend und verschleimend.

Auf einem abgestorbenen, überwinterten Blatte von *Pirola rotundifolia*: Mähr.-Weisskirchen: Nadelwälder bei Bodenstadt, V. 1928.

Phyllosticta pirolae E. et E. weicht durch die auf den lebenden Blättern erscheinenden, kreisrunden, 1.5—2 mm grossen Flecken ab, stimmt aber in bezug auf die kurzen, Pykniden und Konidien betreffenden Angaben sehr gut überein, weshalb ich an ihrer Identität nicht zweifeln kann. Die abweichende Fleckenbildung des amerikanischen Pilzes ist wahrscheinlich darauf zurückzuführen, dass er auf lebenden Blättern im Juli gefunden wurde. *Ph. pirolae* Allesch. in Ber. Bayer. Bot. Ges. 1896, p. 3 mit nur 3—4 μ langen Konidien ist wohl sicher verschieden, wurde aber von Allesch. in Rabh. Kryptfl. VI. p. 139 (1898) mit *Ph. pirolae* E. et E. identifiziert.

33. **Selenophoma epilobii** Petr. n. spec.

Pycnidia irregulariter et laxe, tunc plerumque late dispersa, non raro greges plus minusve effusos, densos formantia, subepidermalia, depresso-globosa vel ellipsoidea, interdum plus minusve irregularia, 130—260 μ diam., raro paulo majora, poro rotundato vel elliptico, plerumque plus minusve anguloso, 40—50 μ diam. vel usque ad 60 μ

longo aperta; pariete 15—20 μ crasso, contextu pseudoparenchymatico, e cellulis rotundato-angulosis, vix vel lenissime compressis, obscure atro-olivaceis, 8—16 μ diam. metientibus composito; conidia numerosissima, mucoso-conglutinata, anguste fusoidea, utrinque attenuata et acuminata, plus minusve falcato-curvata, rarissime fere recta, hyalina, continua, 10—16 μ, raro usque ad 20 μ longa, 1.5—2 μ lata.

Auf dürren Stengeln von *Epilobium angustifolium*. Schweden; Jämtland; Are s : n, Storlien, 24. VI. 1932, leg. A. G. Eliasson. — Härjedalen: Tännäs, s:n Fjöllnäs, 2. VII. 1933, leg. A. G. Eliasson.

Dieser Pilz wächst stets in Gesellschaft von *Discosphaerina epilobii* (Wallr.) Petr., deren Nebenfruchtform er ist. Nur die an erster Stelle genannte Kollektion zeigt ihn in besser entwickeltem Zustande. Die Exemplare von Fjällnäs sind meist ganz alt oder überreif.

34. *Septoria echinopsis* Moesz in Bot. Közlemén. XXII. p. 46 (1924). — Damit ist die gleichnamige Art von Savulescu und Sandu in Hedwigia LXXV. p. 201 (1936) identisch.

35. *Stagonospora calamagrosticola* Petr. in Annal. Mycol. XXV. p. 247 (1927) muss **Stagonospora epigeios** Petr. n. nom. heissen, weil es schon eine gleichnamige, ältere Art gibt, die l. c. XX. p. 26 (1922) beschrieben wurde.

36. *Stictochorella lupini* Syd. in Annal. Mycol. XX. p. 202 (1922) ist eine *Asteromella*, die **Asteromella lupini** (E. et E.) Petr. comb. nov. zu heissen hat. Als Synonyme gehören noch dazu: *Phoma lupini* E. et E. in Bull. Washb. Coll. Lab. Nat. Hist. I. p. 6 (1886). — *Phyllosticta ferax* E. et E. Proc. Acad. Philad. Pt. III. 1894, p. 355. — *Stictochorella lupini* (E. et E.) Syd. l. c. XXII. p. 397 (1924).

37. **Cercospora Ahmadii** Petr. n. spec. — Syn. *Cercospora marsdeniae* Ahmad in sched. 1949 nec *Cercospora marsdeniae* Hansf. in Proc. Linn. Soc. London CLVIII. p. 50 (1947).

Caespituli semper hypophylli, sine maculis decolorationes tantum pallide viridulas, postea sordide griseo- vel olivaceo-viridulas efficientes, densissime fusco-olivacei, ambitu omnino irregulares, angulosi, plerumque nervis bene limitati, primo laxe dispersi, postea numerosi, tunc saepe aggregati, plus minusve confluentes et magnam folii partem occupantes; mycelium intramatricale bene evolutum, ex hyphis undulato curvulis convolutisque tenuioribus subhyalinis, crassioribus pallide olivaceis, indistincte septatis, 2—5 mm crassis compositum; hypostromate irregulariter globoso vel ovoideo, plerumque 20—35 μ, raro usque ad 50 μ diam., contextu pseudoparenchymatico, e cellulis irregulariter angulosis, obscure olivaceis, 3—6 μ diam., metientibus composito; conidiophora dense stipata, plus minusve divergentia, simplicia, plerumque 1- raro 2—3-septata, plus minusve torulosa, raro fere recta, griseo-olivacea, apicem versus plus minusve pallidiora,

ca. 30—40 μ, raro usque ad 65 μ longa, 4—6.5 μ crassa; conidia quoad formam et magnitudinem variabilissima, minora oblonga vel clavata, anguste fusoidea vel fere cylindracea, 1—3-septata, ad septa non vel lenissime constricta, majora elongato-cylindracea vel filiformi-obclavata, postice plerumque distincte truncata, apicem versus paulatim attenuata, 3—6-septata, pallide olivacea, plasmate laxe granuloso et guttulis oleosis minutis praedita, 13—50 μ, raro usque ad 72 μ longa, 3—6.5 μ lata.

Auf lebenden Blättern von *Marsdenia Roylei;* Pakistan: Murree, 22. IX. 1949, leg. S. A h m a d, Nr. 2903.

Cercospora marsdeniae Hansf. auf *Marsdenia anaolensis* in Uganda unterscheidet sich von *C. Ahmadii* durch ganz andere Fleckenbildung und etwas längere, aber schmälere Konidien.

38. *Camptomeris astragali* Bessey in Pap. Michig. Acad. Sci. Arts Lett. XL p. 3 (1955) ist mit *Epicoccum sinense* Petr. in Medd. Göteborgs Bot. Trädgard XVII. p. 162 (1947) identisch und wäre deshalb als **Camptomeris sinensis** Petr. comb. nov. einzureihen.

Xenotypa n. gen., eine neue Diaportheen-Gattung.

Von F. Petrak (Wien).

Mit einer Tauschsendung verschiedener Pilze erhielt ich vor längerer Zeit von H. Sydow auch ein Exemplar von *Cenangella radulicola* (Fuck.) Rehm, das er im August 1911 auf *„Radulum aterrimum"* an dürren Ästen von *Betula alba* auf der Insel Sylt gesammelt hatte. Die Untersuchung dieser Kollektion zeigte mir damals in der schwarzen *„Radulum"*-Kruste Perithezien eines Pyrenomyzeten, deren Fruchtschicht ganz verdorben war. Ich erkannte zwar damals, dass hier ein sehr eigenartig gebauter Pilz vorliegen müsse, konnte aber trotz aller Mühe keine besser entwickelten Gehäuse finden. Dass dieser Pilz schon von Höhnel näher untersucht und in Sitzb. Ak. Wiss. Wien, Math. nat. Kl. Abt. I. CXVIII. p. 1465 (1910) als *Eutypa hydnoidea* (Fr.) v. Höhn. eingereiht wurde, habe ich erst später anlässlich eines die Literatur über die Gattung *Eutypa* betreffenden Studiums feststellen können. Auf Grund meiner an dem oben erwähnten Material gemachten Beobachtungen musste ich jedoch an der Richtigkeit dieser Auffassung v. Höhnel's zweifeln.

Kürzlich wurde dieser Pilz als *Eutypa aterrima* (Fr.) Nannf. von S. Lundell und J. A. Nannfeldt in den Fungi Suecici praesertim Upsalienses unter Nr. 2163 ausgegeben. Herr Prof. Dr. J. A. Nannfeldt hat mir auf meine Bitte von dieser Kollektion in dankenswerter Weise ein reichliches, prächtig entwickeltes Material gesendet, welches mir zeigte, dass dieser Pilz, wie die folgende Beschreibung zeigen wird, von *Eutypa* ganz verschieden ist.

Stroma ausgebreitet, die Äste ringsum und oft auf grosse Strecken hin überziehend, unter dem Periderm dem Rindenparenchym auf- und oft auch etwas eingewachsen, eine ziemlich gleichmässig 50—90 μ dicke, pseudoparenchymatische Kruste bildend, die aus rundlich-eckigen, ziemlich dickwandigen, olivbraunen, ca. 5—10 μ grossen Zellen besteht und von zahlreichen, ganz verschrumpften Substratresten durchsetzt wird. Weiter innen werden die Zellen allmählich kleiner, färben sich heller und gehen endlich in eine bis ca. 300 μ dicke, von zahlreichen, kleinen, orangerot verfärbten, ganz verschrumpften Substratresten durchsetzte Schicht von reich und dicht verzweigten, hell olivbräunlichen, dünnwandigen, 2—4 μ breiten Hyphen über, in der sich die Perithezien entwickeln. Das Periderm wird bald abgeworfen oder gegen den Rand hin eingerollt und das pechschwarze Stroma entblösst. Die Oberfläche desselben wird oft von Querrissen durchzogen und ist mit mehr oder weniger zahlrei-

chen, oft sehr dicht stehenden, in bezug auf Form und Grösse sehr veränderlichen Fortsätzen versehen, die ca. 40—350 μ, selten bis 600 μ hoch und 30—270 μ dick, spitz oder stumpf konisch, oben bisweilen auch abgestutzt, dann fast zylindrisch oder verdickt und dann keulig, oft auch von zwei Seiten mehr oder weniger zusammengedrückt sind. Das massive Gewebe dieser Fortsätze besteht aus einem wenigstens im mittleren Teile deutlich senkrecht prosenchymatischen Gewebe von teils isodiametrischen, teils etwas gestreckten, bis ca. 18 μ langen, 6—12 μ breiten, schwarzbraunen, dünnwandigen, an der Oberfläche kleinschollig-krümelig abwitternden Zellen. Die ganze Oberfläche des Stromas ist zwischen diesen Fortsätzen mit meist sehr zahlreichen, dicht stehenden, ca. 6—20 μ dicken, kürzeren oder längeren, miteinander durch mehr oder weniger zahlreiche Seitenäste in Verbindung stehenden, kurzgliederigen, nur aus wenigen, parallelen Hyphen bestehenden, sich in einfache oder etwas ästige, meist stark verschrumpfte, ca. 2.5—4 μ dicke Enden frei auflösenden Strängen bedeckt, die ihm bei schwacher Vergrösserung eine fast samtartige Beschaffenheit verleiht.

Perithezien ziemlich dicht zerstreut, der untersten Stromaschicht eingewachsen, mehr oder weniger niedergedrückt rundlich oder breit ellipsoidisch, ca. 300—400 μ gross, oben in ein oft ganz schiefes, zylindrisch-kegelförmiges, an der Spitze breit abgerundetes, ca. 200—300 μ, seltener bis ca. 500 μ langes, 80—130 μ dickes, mehr oder weniger stark schnabelartig vorragendes Ostiolum verjüngt. Peritheziummembran häutig, unten ca. 12—20 μ, oben bis ca. 30 μ dick, aus einigen Lagen von stark zusammengepressten, unregelmässig eckigen, durchscheinend schwarzbraunen, bis ca. 18 μ grossen, ziemlich dünnwandigen Zellen bestehend, aussen in das Gewebe des Stromas übergehend, keine scharfe Grenze zeigend, innen plötzlich in eine konzentrisch faserig zellige, inhaltsreiche, hyaline Schicht übergehend, die sich oben am Grunde des Ostiolums bis auf ca. 60 μ verdickt und eine kleinzellige, pseudoparenchymatische Beschaffenheit annimmt. Die Aussenkruste des Ostiolums besteht aus senkrecht parallelen Reihen von meist etwas gestreckten, 2.5—4 μ breiten, bis ca. 10 μ langen, olivbraunen Zellen, die sich immer heller färben und in aufrecht abstehende, kurzfädige, hyaline Periphysen übergehen. Aszi sehr zahlreich, in vielen Schichten übereinander stehend, keulig, oben stumpf abgerundet, unten meist ziemlich stark, seltener auch oben schwach verjüngt, dann oft etwas spindelig, sehr zartwandig, 8-sporig, p. sp. 20—28, selten bis 32 μ lang, 5—7 μ breit. Sporen mehr oder weniger zweireihig, stäbchenförmig, beidendig stumpf, nicht verjüngt, gerade oder schwach gekrümmt, hyalin, einzellig, oft mit zwei polständigen, ziemlich undeutlichen Öltröpfchen, 7—10 μ, selten bis ca. 12 μ lang, 1—2 μ, meist ca. 1.5 μ breit. Pseudoparaphysen spärlich, einfach,

fädig, sehr zartwandig, mit kleinen, ziemlich stark lichtbrechenden Öltröpfchen, ca. 1—1.5 μ breit, bald verschleimend.

Schon aus der hier mitgeteilten Beschreibung dürfte klar hervorgehen, dass dieser Pilz mit *Eutypa* nichts zu tun hat. Die zahlreichen Arten dieser Gattung unterscheiden sich schon durch das meist sehr schwach entwickelte, nur durch eine mehr oder weniger intensive Schwärzung der Substratoberfläche angedeutete, niemals in freie, prosenchymatische, senkrecht abstehende Fortsätze übergehende Stroma, durch die an der Spitze oft furchigen Mündungen, durch zwar auch sehr zarte, aber mehr oder weniger lang gestielte, sich erst spät ablösende Aszi, meist honiggelb oder hell olivbräunliche, typisch allantoide Sporen und viel zahlreichere Pseudoparaphysen. *Radulum aterrimum* Fr. muss daher als Typus einer neuen Gattung aufgefasst werden, die auf folgende Weise zu charakterisieren wäre.

Xenotypa Petr. n. spec.

Stroma late effusum, crustaceum, sub peridermio evolutum, eo dejecto et recurvato mox omnino denudatum, aterrimum, contextu ad superficiem pseudoparenchymatico, atro-brunneo, in cortice plus minusve plectenchymatico et pallide olivaceo, processubus sterilibus, verticaliter prosenchymaticis, atro-olivaceis, quoad formam variabilissimis, plerumque conoideis, clavatis vel cylindraceis obtectum; perithecia cortici omnino innata, globosa, plus minusve depressa, ostiolo saepe valde obliquo, plus minusve prominulo, saepe rostriformi praedita; pariete membranaceo, contextu pseudoparenchymatico, olivaceo; asci numerosi, clavati vel subfusoidei, tenerrime tunicati, 8-spori; sporae bacillares, rectae vel lenissime curvulae, continuae, hyalinae: pseudoparaphyses paucae, filiformes, mox mucosae.

Xenotypa aterrima (Fr.) Petr. comb. nov.

Syn.: *Radulum aterrimum* Fr. Elench. Fung. I. p. 148 (1828); Syst. Myc. I. p. 416 (1821).

Sphaeronema hydnoideum Fr. in K. Vet. Acad. Handb. XXXIX. p. 358 (1818).

Hydnum aterrimum Fr. Syst. Myc. I. p. 416 (1821).

Racodium turfaceum var. *coronatum* Pers. Myc. europ. I. p. 68 (1822).

Eutypa hydnoidea v. Höhn. in Sitzb. Ak. Wiss. Wien, Math. nat. Kl. Abt. I. CXVIII. p. 1465 (1910).

Eutypa aterrima Nannf. Trans. Brit. Myc. Soc. XX. p. 204 (1936).

Jetzt sei noch kurz erwähnt, dass ich geneigt bin, diesen Pilz für einen ursprünglich auf *Radulum laetum* Fr. = *Peniophora incarnata* (Pers.) Cke. var. *hydnoidea* (Pers.) B. et G. wachsenden Parasiten

zu halten, dem er habituell in bezug auf Form und Art seines Wachstums sehr ähnelt, weshalb er ja von F r i e s auch als eine *Radulum*-Art aufgefasst wurde. Das mir vorliegende, gut ausgereifte, teilweise auch schon überreife Material war leider für eine sichere Entscheidung dieser Frage nicht geeignet, weil es in der Entwicklung schon zu weit vorgeschritten war. Nur auf einem Stück war der Pilz etwas jünger. Durch Vergleich von Querschnitten dieses Exemplares mit solchen von *Radulum laetum* konnte ich eine weitgehende Übereinstimmung der innersten Randzone des Stromas mit dem innersten Gewebe von *R. laetum* feststellen. Eine sichere Entscheidung dieser Frage muss jedoch weiteren Studien, speziell der Untersuchung ganz junger Entwicklungsstadien vorbehalten bleiben.

Neue Uredineen.

Von F. Petrak (Wien).

Aecidium puracense Petr. n. spec.

Aecidia in ramulis et petiolis infectis deformationes efficientia, nunc laxe et irregulariter, nunc dense vel densissime distributa, depresso-cupuliformia, primum clausa, mox aperta, 250—400 μ diam. raro etiam paulo majora; cellulis peridii arcte conjunctis, ambitu plus minusve isodiametricis, ambitu orbicularibus vel late ellipticis, semper plus minusve angulosis et irregularibus, e latere irregulariter rhomboideis, hyalinis, 15—28 ⇌ 12—20 μ, pariete ca. 5—6.5 μ crasso, exteriore laevi, interiore dense verrucoso-echinulato; sporae quoad formam et magnitudinem variabiles, ovoideae, ellipsoideae vel oblongae, non raro subglobosae, saepe plus minusve angulosae, hyalinae, 14—23 ⇌ 10—18 μ, vel 15—18 μ diam., episporio ca. 2 μ crasso, sublevi vel minutissime verruculoso.

Auf jungen, noch im Wachstum begriffenen Ästen und Blattstielen, selten und spärlich auch auf den Blättern von *Dioscorea* spec.; Columbia; District Cauca: Puracé, 2700 m. II. 1938, leg. K. von Sneidern.

Von den beiden isolierten Äzidien, die bisher auf *Dioscorea* beschrieben wurden, unterscheidet sich *Ae. dioscoreae* Lindquist in Rev. Fac. Agron. Buenos Aires XXIX. p. 41 (1953) vor allem durch die nur hypophyll auf den Blättern auftretenden Äzidien und etwas kleinere Sporen, von dem auch Hexenbesen verursachenden *Ae. leonense* Cummins durch wesentlich grössere Sporen. Dieser Pilz verursacht charakteristische Hexenbesen, mit verkürzten, mehr oder weniger stark verdickten Haupt- und oft stark verkümmerten Seitenästen. Die sehr klein bleibenden Blätter sind meist ganz deformiert.

Aecidium Zernyanum Petr. n. spec.

Maculae solitariae vel irregulariter et laxe dispersae, utrinque visibiles, ambitu orbiculares vel late ellipticae, interdum plus minusve irregulares, in epiphyllo obscure griseo-olivaceae, interdum fere nigrescentes vel sordide purpurascentes. 2—7 mm diam., decolorationibus pallide flavo-griseo- vel brunneo-viridulis cinctae, in hypophyllo plus minusve pallidiores; pycnidia epiphylla, plus minusve dense dispersa vel laxe gregaria, subepidermalia, depresso-globosa, ca. 50—80 μ diam.; aecidia semper hypophylla, densissime gregaria

et stipata, saepe centrum macularum sterile circulariter cingentia, subepidermalia, late ovoidea, ellipsoidea vel subglobosa, omnino immersa, parum vel vix prominula, ca. 140—250 μ diam., primum clausa, postea cupulato-aperta; peridio fragili, vix exserto; cellulis peridii fere regulariter hexagonis, hyalinis, ca. 20—26 μ diam., pariete minutissime verruculoso-punctato, ca. 1.5—2 μ crasso; aecidiosporae late ellipsoideae, ovoideae vel subglobosae, hyalinae vel subhyalinae, 15—20 ⇌ 13—17 μ vel ca. 14—18 μ diam.

Auf lebenden Blättern von *Polygonum serrulatum*; Afrika: Südwest-Tanganyika; Matengo-Hochland; WSW von Songea, sumpfige Stellen unterhalb Ugano, ca. 1400 m, 2. I. 1936, leg. H. Zerny.

Der Pilz entwickelt sich aus einem, das ganze Mesophyll durchziehenden, hyalinen oder subhyalinen, faserig oder krümelig kleinzelligen Gewebe, dem die ganz verschrumpften, meist rostbraun oder orangegelb verfärbten Zellen des Substrates einzeln oder in kleinen Komplexen eingelagert sind. Subepidermal, bisweilen auch unter der obersten subepidermalen Zellschicht des Schwammparenchyms entwickelt sich ein ca. 180—240 μ dickes, senkrecht prosenchymatisch-grosszelliges Gewebe, das oben fest mit der Epidermis verwachsen ist und aus völlig hyalinen, gelatinös-dickwandigen, englumigen, in senkrechter Richtung stark gestreckten, bis ca. 60 μ langen, 8—14 μ breiten Zellen besteht. Diesem, einem Stroma gleichenden Prosenchym sind die Äzidien vollständig eingesenkt. Sie sind zuerst völlig geschlossen, flach pustelförmig vorgewölbt, reissen später auf und sind meist bis zum Rande geöffnet, welcher der Hauptsache nach aus der aufgebogenen Epidermis des Blattes gebildet und von der aufgerissenen Peridie kaum überragt wird, deren Zellen eine mehr oder weniger regelmässig sechseckige Form haben und von unten nach oben an Grösse etwas zunehmen.

Caeoma torosum Petr. n. spec.

Aecidia ramicola, tumores maximos, usque ad 5 cm longos, ad 3 cm latos, omnino irregulares, tuberosos, ad superficiem ob sporarum massam pulverulentam pallide ochraceos, verrucoso-torosos efformantia, urophysibus laxe dispersis, paulo prominulis, filiformibus, ca. 2—3.5 μ crassis, tenuiter tunicatis praedita; sporae quoad formam et magnitudinem variabilissimae, oblongae, ovoideae, piriformes, rarius fabaeformes, saepe plus minusve irregulares, dense et oblique rugulosae, rugis tenerrimis, arcuato-parallelis, in acie minutissime echinulatis, hyalinae, acervatim pallidissime flavescentes, 20—33 μ, raro usque ad 40 μ longae, 13—23 μ latae, interdum subglobosae, tunc ca. 20—25 μ diam., episporio ca. 2—3 μ, antice usque ad 5 μ crasso.

Auf einem lebenden Ästchen einer unbekannten Nährpflanze. Peru: Huacapistana, IV. 1921, leg. Sten von Rosen.

Die Matrix ist ein ca. 8 mm dickes, etwas stumpfkantiges Ästchen, dessen dicht feinstachelig-rauhe Rinde mit einzelnen, grösseren, herabgebogenen Stacheln und mit sehr langen, steifen und dicken, rostgelben oder hell und schmutzig orangegelben Borsten besetzt ist. Daran sitzt seitlich eine riesige, knollenförmige, mit ca. 0.5—1.5 mm breiten, gekröse- oder gehirnartig gewundenen und faltigen Wülsten versehene Pilzgalle, deren Oberfläche gleichmässig von den pulverigen ockergelben Sporenmassen bedeckt wird. Das Gewebe dieser Galle besteht aus hypertrophisch stark vergrösserten, mehr oder weniger stark gestreckten, seltener fast isodiametrischen, bis ca. 120 μ langen, 40—70 μ breiten Zellen; diese sind mehr oder weniger, weiter innen meist vollständig mit einer spröden, harten, hell gelblichen oder gelbbräunlichen Masse erfüllt, die aus erhärtetem Schleim besteht, der sich im Wasser zu einer schleimigen, sehr feinkörnigen Masse auflöst. Die Sporenmassen werden von locker stehenden, hyalinen, zartwandigen, fädigen Urophysen überragt.

Die Nährpflanze dieses schönen, durch seine Grösse sehr auffälligen Pilzes ist leider nicht bekannt. Sie dürfte einer *Rubus*-Art angehören.

Phragmidium acaenincola Petr. n. spec.

Teleutospori semper hyphophylli sine maculis in folii pagina superiore sero decolorationes indistincte limitatas, brunnescentes vel sordide purpurascentes efficientes, irregulariter et laxe dispersi, solitarii vel saepe 2—3 plus minusve aggregati, tunc saepe confluentes, ambitu orbiculares, elliptici vel plus minusve irregulares. ca. 100—600 μ diam., confluendo etiam majores; teleutosporae cylindraceae vel clavato-cylindraceae, minores oblongae vel oblongo-ellipsoideae, apice in papillam pallide flavescentem vel subhyalinam, 3—13 μ, rarissime usque ad 16 μ longam contractae, basi late rotundatae, non vel lenissime attenuatae, plerumque 4—5- raro 2—3 rarissime 6-septatae, ad septa non vel vix constrictae, verrucis majusculis depresso-hemisphaericis, subhyalinis, basi ca. 1—3 μ latis, plus minusve, plerumque dense obsitae, 43—65 μ, rarissime usque ad 82 μ longae, 17—22 μ latae, atro-brunneae, in maturitate fere opacae, in quaque cellula poris germinationis plerumque 2 praeditae; pedicello persistente ca. 32—65 μ longo, superne pallidissime brunneolo, 6—10 μ crasso, basin versus hyalino et usque ad 20 μ incrassato.

Auf lebenden Blättern von *Acaena crinifolia*; Mt. Kosciusko, 6000 ft., Australien, 29. III. 1955, leg. E. Gauba.

G. H. Cunningham hat in Trans. New Zealand Inst. LV. p. 18—20 (1924) auf *Aeaena*-Arten vier Phragmidien aus Neuseeland

angeführt, nämlich *Ph. acaenae* G. Cunn. auf *A. microphylla, Ph. novae-zelandiae* G. Cunn. auf *A. novae-zelandiae, Ph. subsimile* G. Cunn. auf *A. sanguisorbae* var. *pilosa* und *A. sanguisorbae* und *Ph. potentillae* Karst auf *A. sanguisorbae, A. sanguisorbae* var. *pallida* und *A. ovina.* Später hat der genannte Autor l. c. LXI. p. 403 (1930) noch eine fünfte Art, nämlich *Ph. acuminatum* G. Cunn. beschrieben, die auf *A. sanguisorbae* gefunden wurde. Diese 5 *Phragmidium*-Arten lassen sich von *Ph. acaenincola* Petr. durch folgende Merkmale unterscheiden:

Ph. acaenae: Sporen meist mit 6 Querwänden, lang zylindrisch. etwas grösser, hell kastanienbraun, mit spärlichen, nur oben etwas zahlreicheren, hyalinen Warzen besetzt.

Ph. novae-zelandiae: Sporen meist mit 6—7 Querwänden, wesentlich grösser, „sepiabraun", ihre Stiele bis ca. 100 μ lang, unten nicht oder nur sehr schwach verdickt.

Ph. potentillae: Sporen etwas grösser, am Scheitel verjüngt oder abgerundet, ohne Papille, an den Querwänden mehr oder weniger eingeschnürt, „goldbraun', glatt, ihre Stiele bis ca. 200 μ lang, nicht oder kaum verdickt. G. H. Cunningham weist ausdrücklich darauf hin, dass die von ihm als *Ph. potentillae* bezeichneten Pilze auf *Acaena* von den europäischen, auf *Potentilla* vorkommenden Formen in mancher Hinsicht abweichen. Ob hier nur eine Form von *Ph. potentillae* oder eine davon spezifisch verschiedene Art vorliegt. wird noch näher zu prüfen sein.

Ph. subsimile: Sporen meist 6-zellig, etwas breiter, beidendig schwach aber meist deutlich verjüngt, kastanienbraun, mit spärlichen Warzen besetzt, ihre Stiele bis ca. 100 μ lang.

Ph. acuminatum: Sporen meist 4-zellig, etwas grösser, mit unten kaum verdickten, bis ca. 200 μ langen Stielen.

Prospodium Cumminsii Petr. n. spec.

Pycnidia et aecidia ignota; sori teleutosporiferi semper hypophylli irregulariter et laxe, interdum dense dispersi, tunc saepe subgregarii et magnam folii partem aequaliter et fere omnino obtegentes. ambitu orbiculares vel late elliptici, 50—150 μ diam., confluendo etiam multo majora et omnino irregularia, atro-brunnea, pulverulenta; aecidiosporae in soris teleutosporiferis tantum evolutae, ca. 30—36 ⇌ 24—26 μ vel ca. 26—32 μ diam., pallide brunneae, episporio in apice ca. 3.5—5 μ crasso, dense verrucosae, verrucis subconicis, hyalinis vel subhyalinis, usque ad 3 μ altis; teleutosporae late ellipsoideae. utrinque rotundatae, rectae, raro inaequilaterae, circa medium septatae, plus minusve constrictae, castaneo-brunneae, 38—50 μ longae. 26—34 μ latae, episporio 3—3.5 μ crasso, antice vix vel lenissime incrassato, subremote verruculoso, verrucis applanato-hemisphaericis.

ab basin 1.5—2 μ latis; pedicello hyalino vel subhyalino, crasse tunicato, medio septato, 60—85 μ, raro usque ad 100 μ longo, 4—6 μ lato; poro germinationis superiore apicali, inferiore prope basin sito.

Auf lebenden Blättern von *Clytostoma callistegioides*. Argentina: Jardin, Instituto Miguel Lillo, 30. VIII. 1951, leg. R. Singer. T. 1590.

Auf *Clytostoma callistegioides* hat P. Hennings in Hedwigia XXXIII. p. 229 (1894) ein uredinoides Aecidium als *Uromyces Hieronymianus* beschrieben. Sydow hat die Zugehörigkeit dieses Pilzes zu *Prospodium* erkannt und ihn in Annal. Mycol. XXX. p. 95 (1932) als *Prospodium oblectum* beschrieben. Die zugehörige Teleutosporenform wurde erst viel später von Cummins in Bull. Torr. Bot. Club LXXIX. p. 216 (1952) beschrieben. Sie unterscheidet sich von der mir vorliegenden Kollektion durch viel kleinere Teleutolager (ob immer?), durch kleinere Teleutosporen mit dickerem, flach- und ziemlich grobwarzigem Epispor und etwas längere Stiele. Herr Prof. Dr. G. B. Cummins, dem ich eine Probe dieses Pilzes gesendet habe, glaubt auch, dass er von *P. oblectum* verschieden sein muss. Da er die Gattung *Prospodium* monographisch revidiert hat, erlaubte ich mir, diese Art ihm zu Ehren zu benennen.

Puccinia geranii-aculeolati Petr. n. spec.

Maculae utrinque visibles, solitariae vel laxe dispersae, ambitu orbiculares vel ellipticae, brunneae vel rufo-brunneae, indistincte limitatae, 2—6 mm diam., interdum aggregatae, tunc saepe paulo majores et omnino irregulares; sori teleutosporiferi amphigeni sed plerumque hypophylli, laxe vel subdense dispersi, in et sub epidermide evoluti, mox denudati, pulverulenti, ambitu orbiculares vel elliptici, saepe irregulares, 150—350 μ diam., raro et plerumque confluendo tantum etiam majores, obscure brunnei; teleutosporae late ellipsoideae vel ovoideae, interdum fere subglobosae, utrinque late rotundatae, non vel postice tantum leniter attenuatae, interdum plus minusve irregulares, medio septatae, vix vel leniter attenuatae, loculo superiore minutissime verruculoso, episporio ubique ca. 1.5—2 μ crasso, apice non incrassato, pallide castaneo-brunneae, 21—30 μ, raro usque 32 μ longae, 17—20 μ latae, pedicello hyalino, brevi, valde caduco.

Auf lebenden Blättern von *Geramium aculeolatum*. Ostafrika; Südwest-Tanganyika; Matengo-Hochland, WSW von Songea in feuchten Gebüschen bei Ugano, ca. 1600 m, 5. V. 1936, leg. H. Zerny.

Puccinia escharoides Syd. in Deutsch-Zentr. Afrika Exped. II. p. 95 (1908—9) stimmt nach der Beschreibung mit dem mir vorliegenden Pilze in vieler Hinsicht, besonders auch in bezug auf Form und Grösse der Sporen völlig überein. Die Sporen sollen aber überall mit relativ grossen, spitzlichen, sehr dicht stehenden Wärzchen

besetzt sein. Bei den Sporen der *P. geranii-aculeolati* ist nur die obere Zelle mit sehr kleinen, flachen, nicht spitzlichen, nur bei sehr starker Vergrösserung deutlich sichtbaren Wärzchen besetzt, während die untere Zelle glatt oder nur sehr undeutlich punktiert ist. Deshalb glaube ich, dass der Pilz auf *Geranium aculeolatum* nicht mit *Puccinia escharodes* identifiziert werden kann.

Uromyces meygounensis Petr. n. spec.

Mycelium singulos ramos omnino, rarius partim inficiens, in foliis saepe brevioribus et latioribus fructificans; pycnidia non visa; aecidia et sori uredisporiferi etiam ignoti; sori teleutosporiferi amphigeni, densissime gregarii, plerumque magnam folii partem densissime obtegentes, subepidermales, mox erumpentes, postea fere omnino denudati, ambitu orbiculares vel late elliptici, saepe plus minusve confluentes, atro-brunnei, pulverulenti; teleutosporae plerumque globosae, raro late ellipsoideae vel ovoideae, sat obscure castaneo-brunneae, dense reticulato-verrucosae, verrucis subhyalinis, depresso-hemisphaericis, parum prominulis, ca. 2—2.5 μ diam. metientibus praeditae, 16—23 μ diam., episporio 2.5—3.5 μ crasso; pedicello hyalino brevi, mox viescente et deciduo.

Auf lebenden Blättern von *Euphorbia Bungei*. Iran: Meygoun, 6. VII. 1946, leg. E. Esfandiari.

Es ist mir nicht gelungen, den vorliegenden Pilz mit einer der zahlreichen, auf *Euphorbia* beschriebenen *Uromyces*-Arten zu identifizieren. Er scheint mit *U. Winteri* Wettst. am nächsten verwandt zu sein, weicht davon aber durch die sich meist auf beiden Blattseiten entwickelnden, die befallenen Stellen vollständig bedeckenden Teleutolager und etwas kleinere, dicht mit flach konvexen, nur wenig vorspringenden, nicht kegelförmigen Warzen besetzten Teleutosporen wesentlich ab.

Stomatogenella n. gen., ein neue Gattung der Pyrenomyzeten.

Von F. Petrak (Wien).

Stomatogenella Petr. n. gen.

Perithecia irregulariter dispersa, plerumque solitaria, superficialia, hypostromate tenuiter cylindraceo, indistincte verticaliter fibroso fere opace atro-brunneo, stomatibus innata, globosa, vix vel parum depressa, in vertice fere usque ad marginem lamina stromatica, extus pariete perithecii obtecta, intus contextu pseudoparenchymatico, hyalino inferne e basis centro in loculi contextum interiorem transeunte aucta, omnino clausa, in maturitate probabiliter in laminae centro irregulariter dilabentia et plus minusve late aperta; pariete membranaceo, pseudoparenchymatico, atro-brunneo; asci numerosi, cylindracei, subsessiles vel brevissime noduloso-stipitati, crassiuscule tunicati, 8-spori; sporae oblongo-fusoideae, plerumque rectae, pluriseptatae, olivaceae; paraphyses filiformes, simplices vel ramosae, sero mucosae.

Perithezien unregelmässig zerstreut, meist einzeln, sich ganz oberflächlich entwickelnd, durch ein dünn zylindrisches, undeutlich senkrecht faseriges, fast opak schwarzbraunes Hypostroma den Spaltöffnungen eingewachsen, kaum oder schwach niedergedrückt rundlich, am Scheitel durch eine fast bis zum Rande reichende, scheibenförmige, aussen von der Peritheziummembran überzogene, innen durch ein hyalines, ziemlich kleinzelliges, in der Mitte der Basis mit dem paraphysoiden Binnengewebe des Lokulus in Verbindung stehende, völlig geschlossene, bei der Reife wahrscheinlich in der Mitte ausbröckelnde Platte verdickt. Peritheziummembran häutig, von pseudoparenchymatischem, schwarzbraunem Gewebe. Aszi sehr zahlreich, zylindrisch, sehr kurz knopfig gestielt oder fast sitzend, derbwandig, 8-sporig. Sporen länglich-spindelförmig, meist gerade, mehrzellig, ziemlich hell olivbraun, 11.5 ⇌ 4 μ. Paraphysen zahlreich, einfach oder etwas ästig, spät verschleimend.

Stomatogenella mirabilis Petr. n. spec.

Perithecia semper hypophylla, laxe vel subdense dispersa, solitaria, raro bina complurave subaggregata et tunc saepe series breves, longitudinales formantia, hypostromate cylindraceo, ca. 30 μ crasso, 35—45 μ alto, fere opace atro-brunneo, indistincte fibroso stomatibus innata, globosa, vix vel parum depressa, 180—260 μ diam., raro etiam

paulo majora, in vertice fere usque ad marginem lamina stromatica extus pariete perithecii obtecta, intus contextu pseudoparenchymatico, hyalino, inferne e basis centro in loculi contextum interiorem transeunte aucta, omnino clausa, in maturitate probabiliter e laminis centro irregulariter dilabentia, denique plus minusve late aperta; pariete membranaceo, contextu pseudoparenchymatico, e cellulis rotundato-angulosis, vix vel parum compressis, pro ratione crassiuscule tunicatis, atro-brunneis, 5—10 μ diam. metientibus composito; asci numerosi, cylindracei, antice late rotundati, postice in stipitem brevissimum contracti vel subsessiles, crassiuscule tunicati, 8-spori, p. sp. 50—65 ⇌ 5.5—6.5 μ; sporae monostichae vel indistincte distichae, oblongo-fusoideae, utrinque obtusae et plus minusve, postice saepe magis attenuatae, rectae, raro inaequilaterae, 3- raro 2-septatae, medio leniter, sed plerumque distincte, ceterum non vel vix constrictae, pallide olivaceae, 9—14 ⇌ 3.5—4.5 μ; paraphyses numerosae, tenuiter fibrosae, simplices vel parum ramosae, ca. 1—1.5 μ crassae, sero mucosae.

Perithezien nur hypophyll, unregelmässig locker oder ziemlich dicht zerstreut, meist einzeln, seltener zu zwei oder mehreren dicht beisammen oder hintereinander stehend und dann oft kurze Längsreihen bildend, sich ganz oberflächlich entwickelnd, durch ein zylindrisches, ca. 30 μ dickes, 35—45 μ hohes, undeutlich senkrecht faseriges, fast opak schwarzbraunes Hypostroma den Spaltöffnungen eingewachsen, kaum oder schwach niedergedrückt rundlich, 180—260 μ im Durchmesser, selten noch etwas grösser, am Scheitel durch eine eigentümliche, fast bis zum Rande reichende, kreisrunde, ca. 20—25 μ dicke Platte verstärkt, die aus einem pseudoparenchymatischen Gewebe von ca. 3.5—6.5 μ grossen, hyalinen, rundlich eckigen, relativ dickwandigen Zellen besteht. Eine rundliche, im Durchmesser ca. 35—45 μ grosse Stelle der basalen Mitte dieser Platte geht in das übereinstimmend gebaute, aber aus etwas dünnwandigeren Zellen bestehende, den Lokulus über den Schläuchen ausfüllende Gewebe über. Die häutige, ca. 10—12 μ dicke Peritheziummembran besteht aus einem pseudoparenchymatischen Gewebe von rundlich eckigen, relativ dickwandigen, schwarzbraunen, 5—7 μ, selten bis ca. 10 μ grossen, kaum oder schwach zusammengepressten Zellen; am Rande des Scheitels teilt sie sich unter einem spitzen Winkel; der unten abzweigende Teil biegt sofort nach innen um und bildet die Decke des Peritheziumscheitels; der obere Teil überzieht als Aussenkruste die stromatische Scheitelplatte, die als ein eigentümliches Klypeusstroma aufgefasst werden kann. Die Öffnung der zuerst völlig geschlossenen Fruchtkörper erfolgt wahrscheinlich durch Zerfall und Ausbröckeln des Scheitels. Aszi sehr zahlreich, zylindrisch, oben breit abgerundet, unten in einen sehr kurzen, knopfigen, kaum über 5 μ langen Stiel

zusammengezogen oder fast sitzend, ziemlich dickwandig, 8-sporig, p. sp. ca. 50—65 ⇌ 5.5—6.5 μ. Sporen ein-, selten sehr unvollständig zweireihig, länglich spindelförmig, beidendig stumpf und mehr oder weniger, unten oft etwas stärker verjüngt, gerade, selten ungleichseitig, mit drei, selten nur mit zwei Querwänden, in der Mitte schwach aber meist deutlich, sonst nicht oder nur sehr schwach eingeschnürt, ziemlich hell olivbraun, 9—14 ⇌ 3.5—4.5 μ. Paraphysen zahlreich, fädig, einfach, selten etwas ästig, ca. 1—1.5 μ dick, erst spät verschleimend.

Auf abgestorbenen Blättern von *Macrozamia spiralis*. N.S.W.: Kangaroo Valley, 21. IV. 1955, leg. E. Gauba.

Der hier beschriebene, durch den eigentümlichen Bau des Fruchtkörpers sehr ausgezeichnete Pilz nimmt zweifellos eine sehr isolierte Stellung ein und wird wohl als Typus einer besonderen Familie aufgefasst werden müssen, die als *Stomatogenellaceae* n. fam. zu bezeichnen und so wie die Gattung zu charakterisieren wäre. In seiner Gesellschaft wächst eine zu ihm gehörige Nebenfruchtform, deren Pykniden etwas kleiner, meist nur ca. 100—160 μ gross sind. Die massenhaft gebildeten, schleimig verklebten Konidien sind sehr breit ellipsoidisch oder eiförmig, hyalin, einzellig, 2.5—3.5 ⇌ 2—2.5 μ gross und entstehen akrogen auf teils einfachen, teils unregelmässig ästigen, die ganze Innenfläche der Pykniden überziehenden Konidienträgern.

Auf der Blattfläche sind zuweilen dunkel olivbraune, ca. 4—6 μ dicke, locker verzweigte Hyphen vorhanden, die einer Dematiee angehören dürften. Ob diese als zweite Nebenfruchtform zu der *Stomatogenella* oder einem ganz anderen Entwicklungskreise angehört, lässt sich nicht mit Sicherheit feststellen.

Ophiosira n. gen., eine neue Gattung der Excipulaceen.

Von F. Petrak (Wien).

Ophiosira Petr. n. gen.

Pycnostromata dispersa, ambitu orbicularia vel late elliptica, hypostromate profunde innato, breviter et crasse cylindraceo-pulvinato, contextu sclerotioideo-plectenchymatico, hyalino praedita, hymenio in strato hypostromatis supremo evoluto, hyphis sub epidermidis pariete exteriore e margine oriundis, hyalinis, plus minusve radiantibus, quasi stratum tegentem formantibus tecto, in maturitate late, plerumque usque ad marginem aperta; conidia filiformi-acicularia, rectiuscula, hyalina, continua, ramuloso-concatenata e conidiophoris breviter cylindraceo-bacillaribus, simplicibus oriunda.

Fruchtkörper vollständig eingewachsen, mit kurz und dick zylindrisch-polsterförmigem, im Umriss rundlichem oder breit elliptischem Hypostroma, von hyalinem, ziemlich stark lichtbrechendem, sklerotialem Gewebe, oben und an den Seite von einer sehr dünnen, olivbraunen Kruste mehr oder weniger scharf begrenzt. Fruchtschicht sich der Hauptsache nach in der Epidermis entwickelnd, am Rande mit zahlreichen, einwärts gebogenen, hyalinen, dickwandigen, in der Jugend von der olivbräunlich verfärbten Epidermisaussenwand bedeckten Hyphen besetzt, bei der Reife unregelmässig, meist von einer Seite aufreissend. Konidien kurz und dünn fädig oder nadelförmig, meist gerade, hyalin, einzellig, in reich verzweigten, auf kurz zylindrisch-stäbchenförmigen, die Oberfläche des Hypostromas ganz oder teilweise überziehenden, einfachen Trägern ausgehenden Ketten entstehend.

Ophiosira austriaca Petr. n. spec.

Pycnostromata irregulariter et laxe dispersa, ut videtur, semper solitaria, ambitu orbicularia vel late elliptica, 250—400 μ longa, 200—300 μ lata, hypostromate profunde et omnino innato, breviter et crassiuscule cylindraceo-pulvinato vel placentiformi, contextu hyalino, sclerotioideo-plectenchymatico, ex hyphis 3.5—7 μ crassis, crassiuscule tunicatis, densissime ramosis et contextis composito praedita; hymenio in strato hypostromatis supremo, ca. 18—35 μ crasso, contextu pseudoparenchymatico, e cellulis rotundato-angulosis, subhyalinis vel pallidissime olivaceo-brunneolis, 2.5—3.5 μ diam. metientibus composito ecoluto, hyphis sub epidermidis pariete exteriore oli-

vaceo-colorato e margine oriundis, undulato-curvulis, quasi stratum tegentem formantibus tecto, eoque plerumque valvaceo-disrumpente fere omnino denudato; conidia breviter filiformi-acicularia, utrinque obtusiuscula, vix vel lenissime attenuata, rectiuscula, hyalina, continua, ramuloso-concatenata, 13—30 ⇌ 1—1.5 μ; conidiophora densissime stipata, cylindraceo-bacillaria, simplicia, 6—10 ⇌ 1.5—2 μ seromucosa.

Fruchtkörper beiderseits unregelmässig und locker zerstreut, wohl immer ganz vereinzelt, im Umriss rundlich oder breit elliptisch, ca. 250—350 μ, seltener bis ca. 400 μ lang, 200—300 μ breit, mit vollständig eingewachsenem, sich zwischen beiden Epidermen entwickelndem, an den Seiten oft unregelmässig und tief eingebuchtetem, 170—230 μ, selten bis ca. 250 μ hohem Hypostroma von fast sklerotialer Beschaffenheit. Auf sehr dünnen Querschnitten scheint es aus einem pseudoparenchymatischen, durch mehr oder weniger zahlreiche, ganz unregelmässige Hohlräume unterbrochenen, kleine, ganz verschrumpfte Substratreste einschliessenden Gewebe von rundlich eckigen, 3.5—5 μ, selten bis ca. 7 μ grossen, relativ dickwandigen Zellen zu bestehen. Auf dickeren Schnitten zeigt es sich, dass das Gewebe plektenchymatisch gebaut ist und aus sehr dicht verzweigten, sehr dicht verflochtenen, hyalinen, ziemlich stark lichtbrechenden, dickwandigen, 3.5—7 μ dicken Hyphen besteht. Die oberste Schicht des Stromas ist ca. 18—23 μ, selten bis ca. 35 μ dick, besteht aus einem pseudoparenchymatischen, hyalinen, oder sehr hell olivbräunlichen, oft kleine, ganz verschrumpfte Reste der Epidermisinnenwand einschliessenden Gewebe von rundlich eckigen, 2.5—3.5 μ grossen, ziemlich dünnwandigen Zellen und wird in Epidermishöhe von den sehr dicht stehenden, zylindrisch-stäbchenförmigen, einfachen, 6—10 μ langen, 1.5—2 μ dicken Konidienträgern bedeckt. In der Jugend wird der Fruchtkörper oben von zahlreichen, radiären, wellig oder fast peitschenförmig gekrümmten, hyalinen, dickwandigen, gegen die Enden etwas verjüngten, an der Spitze stumpf abgerundeten, miteinander verklebten, am Rande entspringenden, der olivbraun verfärbten Epidermisaussenwand innen ziemlich fest anhaftenden Hyphen bedeckt. Bei der Reife wird diese Deckschicht ganz unregelmässig lappig, oft auch von einer Seite deckelartig abgesprengt, wobei sich die entstehenden Lappen mehr oder weniger, meist senkrecht aufrichten, und die graubräunliche Konidienmasse entblössen. Konidien massenhaft schleimig verklebt, kurz fädig oder nadelförmig, ganz gerade beidendig kaum oder nur sehr undeutlich verjüngt, stumpflich, hyalin, einzellig, 13—23 μ, selten bis ca. 30 μ lang, 1—1.5 μ dick, in reich verzweigten Ketten entstehend, die auf zylindrisch-stäbchenförmigen, 6—10 μ langen, 1.5—2 μ dicken, einzelligen, einfachen Konidienträgern entstehen.

Auf stark faulenden, vor 2 Jahren abgestorbenen Blättern von *Carex pendula*; Nieder-Österreich: am Georgenberge bei Purkersdorf im Wiener Wald, X. 1943, leg. F. Petrak.

Von dem prächtig entwickelten Pilze habe ich auf dem angeführten Standorte leider nur sehr wenig Material gefunden. Er zeichnet sich durch das mächtig entwickelte, ziemlich scharf begrenzte, sehr charakteristisch gebaute, fast sklerotiale Hypostroma, durch die am Rande entspringenden, radiären, ziemlich dickwandigen, mit der dickeren Epidermisaussenwand eine Deckschicht bildenden Hyphen und die ganz geraden, nadelförmigen, in verzweigten Ketten entstehenden Konidien aus. Als typische Excipulacee wird er wahrscheinlich als Nebenfruchtform zu einem Diskomyzeten gehören.

Urohendersoniella n. gen., eine neue Gattung der phaeophragmosporen Sphaeropsideen.

Von F. Petrak (Wien).

Urohendersoniella Petr. n. gen.

Pycnidia dispersa, plerumque solitaria, subepidermalia, globosa vel late ellipsoidea; ostiolo plano, papilliformi vel obtuse conico punctiformiter erumpentia; pariete membranaceo, pseudoparenchymatico, pallide olivaceo; conidia anguste fusoidea, utrinque paulatim attenuata, recta vel inaequilatera, raro curvula, pluriseptata, loculis mediis obscure olivaceis, ceteris paulatim pallidioribus, loculo supremo paulatim in ciliam elongatam, plus minusve curvatam, raro fere rectam transeunte; conidiophora totam parietis superficiem interiorem obtegentia, brevissime bacillaria vel subconica, conidiis maturis saepe adhaerentia.

Pykniden mehr oder weniger weitläufig und locker zerstreut, meist subepidermal sich entwickelnd, kaum oder schwach niedergedrückt rundlich oder sehr breit ellipsoidisch, nur mit dem flachen, papillenförmigen oder stumpf konischen Ostiolum punktförmig hervorbrechend; Pyknidenmembran häutig, von pseudoparenchymatischem, ziemlich hell olivbraunem Gewebe. Konidien schmal spindelförmig, beidendig allmählich und ziemlich stark verjüngt, gerade oder ungleichseitig, selten schwach gekrümmt, mit mehreren Querwänden, die mittleren Zellen dunkel olivbraun, die übrigen gegen die Enden heller gefärbt, die oberste Zelle sehr allmählich in eine lange mehr oder weniger gekrümmte, selten fast gerade, allmählich hyalin werdende, derbfädige Zilie verjüngt. Konidienträger die ganze Innenfläche der Wand überziehend, sehr kurz stäbchenförmig oder etwas konisch, den Konidien oft anhaftend.

Urohendersoniella mastigospora Petr. n. spec.

Pycnidia plus minusve irregulariter et laxe dispersa, solitaria, raro bina complurave subaggregata et tunc saepe in series breves, longitudinales ordinata, subepidermalia, globosa vel late ellipsoidea, vix vel parum depressa, 150—200 μ diam., ostiolo plano, papilliformi vel subconico, poro irregulariter rotundato, indistincte limitato, ca. 12—15 μ lato perforato punctiformiter erumpentia, extus hyphis nonnullis obscure melleis vel pallide olivaceis, remote articulatis, simplicibus vel parce ramosis, 2.5—4 μ crassis praedita; pariete molliter membranaceo, 12—15 μ crasso, contextu pseudoparenchymatico, e cellulis irregulariter angulosis, tenuiter tunicatis, vix compressis, 5—12 μ diam. metientibus, pellucide griseo- vel olivaceo-brunneis, intus

pallidioribus minoribusque composito; conidia anguste fusoidea, utrinque paulatim attenuata, recta vel inaequilatera, raro curvula, 3—6-septata, septis mediis manifeste, ceteris vix compressis, non constricta, loculis mediis obscure olivaceis, ceteris paulatim pallidioribus, loculo supremo subhyalino vel pallide flavo-brunneolo, paulatim in ciliam filiformem, hyalinam, ca. 30—55 μ longam, medio 1—1.5 μ crassam, raro fere rectam, plerumque varie curvatam transeunte; conidiophora totam parietis superficiem interiorem obtegentia, brevissime bacillaria, vel subconica, 4—5 ⇌ 1.5—3 μ, conidiis maturis saepe diu adhaerentibus.

Pykniden mehr oder weniger weitläufig und locker zerstreut, meist einzeln, selten zu zwei oder mehreren etwas dichter beisammenstehend, dann meist kurze Längsreihen bildend, sich unter der Epidermis entwickelnd, rundlich oder breit ellipsoidisch, kaum oder schwach niedergedrückt, 150—200 μ im Durchmesser, nur mit dem flachen, papillenförmigen oder stumpf konischen, von einem sehr unscharf begrenzten, rundlichen, ca. 12—18 μ weiten Porus durchbohrten Ostiolum punktförmig hervorbrechend, aussen zerstreut mit einfachen oder etwas verzweigten, ziemlich kurzgliedrigen, dunkel honiggelben oder hell olivbraunen, ca. 2.5—4 μ dicken Hyphen besetzt; Peritheziummembran ziemlich weichhäutig, ca. 12—15 μ dick, von pseudoparenchymatischem, aus unregelmässig eckigen, dünnwandigen, kaum zusammengepressten, 5—12 μ grossen, durchscheinend grau- oder olivbraunen, sich innen heller färbenden, kleiner und oft auch sehr undeutlich werdenden Zellen bestehendem Gewebe. Konidien ziemlich dünn spindelförmig, beidendig allmählich und stark verjüngt, gerade oder ungleichseitig, seltener schwach gekrümmt, mit 3—6 Querwänden, von denen aber meist nur die mittleren deutlich zu erkennen sind, nicht eingeschnürt, die mittleren Zellen ziemlich dunkel olivbraun, die übrigen gegen die Enden heller werdend, die oberste Zelle subhyalin oder nur sehr hell gelbbräunlich gefärbt, ganz allmählich in eine derb fädige, ca. 30—55 μ lange, sich allmählich verjüngende, in der Mitte ca. 1—1.5 μ dicke, selten fast gerade, meist stark und verschieden oft peitschenförmig gekrümmte, allmählich hyalin werdende Zilie übergehend, ohne diese, 17—26 μ lang, 5—6.5 μ breit; Konidienträger die ganze Innenfläche der Membran überziehend, sehr kurz stäbchenförmig oder etwas konisch, 4—5 μ lang, unten 1.5—2.5 μ, selten bis ca. 3 μ breit, sich mit den reifen Konidien ablösend und ihnen noch lange anhaftend.

Auf dürren Blättern und Halmen von *Dianella revoluta* in Gesellschaft anderer Pilze; N.S.W. Wyalong, 7. V. 1955, leg. E. G a u b a.

Dieser schöne, durch die Beschaffenheit der Konidien sehr ausgezeichnete Pilz steht *Urohendersonia* nahe. Bei den Arten dieser Gattung sind aber die Konidien nicht mit einer terminalen Zilie versehen, sondern durch den verlängerten, dünnfädigen Träger geschwänzt.

Pyrenocyclus n. gen., eine neue, den Parmulineen nahe stehende Pyrenomyzetengattung.

Von F. Petrak (Wien).

Pyrenocyclus Petr. n. gen.

Ascomata dispersa, omnino immersa, e basi suborbiculari vel late elliptica depresso-hemisphaerica, in verticis centro saepe manifeste truncata et cupuliformiter excavata; strato tegente scutiformi, matrici omnino innato, subcarbonaceo, opace atro-brunneo, contextu minutissime fibroso-celluloso; strato basali carnoso-membranaceo, hyalino vel subhyalino, indistincte concentrice fibroso, e margine strati tegentis centrum versus ascendente et in stroma sterile, centrale, truncato-conoideum, verticaliter fibroso-cellulosum, infra subhyalinum vel pallide griseo-brunneolum, in vertice plus minusve atro-brunneum transiente; hymenio in margine strati basalis inserto, stroma centrale circulariter cingente; asci sat numerosi, e margine strati basalis oriundi et in marginem superiorem stromatis sterilis centralis oblique inclinantes, cylindraceo-obclavati, breviter stipitati, crasse tunicati, 4—8-spori; sporae oblongo-ellipsoideae, saepe plus minusve clavatae, plerumque rectae, medio septatae, diu hyalinae, denique olivaceae; paraphyses numerosae, fibrosae, simplices vel parce ramosae, sero viescentes et mucosae.

Fruchtkörper zerstreut, ganz eingewachsen, aus rundlicher oder breit elliptischer, ganz flacher Basis sehr flach konvex vorgewölbt, in der Mitte des oft deutlich abgestutzten Scheitels mit einer flach schüsselförmigen, rundlichen Vertiefung versehen, mit der innen ein zentraler, gestutzt konischer, steriler, sich nach unten stark verbreiternder Stromakegel verwachsen ist. Deckschicht ziemlich brüchig kohlig, mehreren Faserschichten des Substrates eingewachsen, von undeutlich und sehr kleinzelligem Gewebe. Basalschicht weichhäutig, fast fleischig, hyalin oder subhyalin, undeutlich konzentrisch faserig, bis zum Rande der Deckschicht reichend, von dieser scharf abgesetzt, in der Mitte in das allmählich aufsteigende, schliesslich senkrecht faserig-zellige, unten subhyaline, sich oben allmählich dunkler färbende, am Scheitel in dunkel schwarzbraune Gewebe des Stromakegels übergehend. Fruchtschicht auf einem ziemlich dicken, am Rande der Basalschicht befindlichen, kreisringförmigen, subhyalinen oder hell gelbbräunlichen Gewebepolster entspringend. Aszi schief gegen den oberen Rand des Zentralstromas geneigt, ziemlich zahlreich, zylindrisch keulig, kurz gestielt, derb- und dickwandig, 8- selten

4—6-sporig. Sporen länglich ellipsoidisch, oft etwas keulig oder fast kurz zylindrisch, in der Mitte septiert, meist gerade, lange hyalin, zuletzt dunkel olivbraun, 23.5 ⇌ 9 μ; Paraphysen zahlreich fädig, einfach oder ästig, spät verschleimend.

Pyrenocyclus ambiguus Petr. n. spec.

Ascomata late dispersa, omnino innata, e basi orbiculari vel late elliptica, depresso-hemisphaerica, 400—750 μ diam., 150—180 μ alta, raro paulo majora, in verticis centro plus minusve truncata et usque ad 100 μ cupuliformiter excavata; strato tegente scutiformi corticis vel ligni stratis cellularum omnino innato, dimidiato-scutato, subcarbonaceo, in vertice ad alvei marginem usque ad 100 μ, ad basin 40—60 μ crasso, contextu minutissime fibroso-celluloso, opace atro-brunneo; strato basali carnoso-membranaceo, ca. 20—30 μ crasso, hyalino vel subhyalino, indistincte concentrice fibroso, e margine strati tegentis centrum versus ascendente et in stroma centrale truncato-conicum, sterile, sursum verticaliter fibroso-cellulosum, infra subhyalinum vel pallide flavo-brunneolum, in vertice plus minusve atro-brunneum transeunte; hymenio in margine strati basalis inserto, stroma centrale circulariter cingente; asci sat numerosi, e margine strati basalis oriundi et in marginem superiorem stromatis centralis inclinantes, cylindraceo-obclavati, antice late rotundati, postice plus minusve saccato-dilatati, breviter stipitati, crasse tunicati, p. sp. 90—115 ⇌ 17—23 μ; sporae incomplete distichae, in juventute fusoideae vel clavato-fusoideae, plasmate homogeneo minutissime granuloso repletae, medio septatae, hyalinae, denique oblongo-ellipsoideae, utrinque late rotundatae, vix vel postice tantum leniter attenuatae, medio septatae, vix vel lenissime constrictae, olivaceae, 19—26 ⇌ 7—11 μ, episporio ca. 1 μ crasso, longitudinaliter tenuissime et parallele striato; paraphyses sat typicae, fibrosae, 1—1.5 μ crassae, simplices vel ramosae, sero viescentes et mucosae.

Fruchtkörper weitläufig, ziemlich unregelmässig und locker zerstreut, meist einzeln, selten zu 2—3 etwas dichter beisammenstehend, den obersten Faserschichten des Holzes oder der Rinde eingewachsen, aus rundlicher oder breit elliptischer, ziemlich flacher Basis flach konvex vorgewölbt, 400—750 μ im Durchmesser, 150—180 μ hoch, selten noch etwas grösser, in der Mitte des oft deutlich abgestutzten Scheitels mit einer rundlichen, schüssel- oder flach trichterförmigen Vertiefung von ca. 70—100 μ Durchmesser versehen, deren Basis von einem zentralen, gestutzt konischen, sterilen, sich nach unten stark verbreiternden, oben ca. 60 μ, unten bis ca. 150 μ dick werdenden, gegen den Rand hin in die Basalschicht übergehenden Stromakegel gebildet wird. Deckschicht den obersten Zellschichten der Matrix vollständig eingewachsen, halbiert schildförmig, von ziemlich brüchig

kohliger Beschaffenheit, am Rande der Scheitelmulde bis ca. 100 μ, unten 40—60 μ dick, von opak schwarzbraunem, sehr undeutlich faserig kleinzelligem Gewebe. Basalschicht von fast fleischiger Beschaffenheit, ca. 20—30 μ dick, subhyalin, in dickeren Schichten sehr hell gelbbräunlich gefärbt erscheinend, einen undeutlich konzentrisch faserigen, bis zum Rande der Deckschicht reichenden, hier das sterile Zentralstroma kreisringförmig umgebenden, ca. 50—70 μ hohen, 30—60 μ dicken, faserig kleinzelligen, subhyalinen, die Fruchtschicht tragenden Gewebspolster bildend, gegen die Mitte in das allmählich aufsteigende, schliesslich senkrecht faserig zellig werdende, unten subhyaline, nach oben allmählich dunkler, am Scheitel schwarzbraun werdende Gewebe des zentralen Stromakegels übergehend; Aszi ziemlich zahlreich, schief gegen den oberen Rand des Zentralstromas geneigt, zylindrisch keulig, unten meist deutlich sackartig erweitert und in einen kurzen, ziemlich dicken, 10—18 μ langen Stiel zusammengezogen, oben breit abgerundet, derb- und dickwandig, 8- selten 4—6-sporig, p. sp. 90—115 ⇌ 17—23 μ. Sporen in der unteren Schlauchhälfte mehr oder weniger zwei- in der oberen einreihig, in der Jugend spindelförmig oder spindelig-keulig, unten meist stärker verjüngt, in der Mitte septiert, mit homogenem, feinkörnigem Plasma, später länglich ellipsoidisch, beidendig breit abgerundet, kaum oder schwach, nur unten oft etwas stärker verjüngt, dann oft etwas keulig, gerade, selten ungleichseitig, an der Querwand kaum oder schwach eingeschnürt, olivbraun, 19—26 ⇌ 7—11 μ, mit ca. 1 μ dickem, der Länge nach dicht und zart gestreiftem Epispor. Paraphysen ziemlich typisch und zahlreich, fädig, einfach oder etwas ästig, 1—1.5 μ dick, spät verschleimend.

Auf Rinde und nacktem Holze eines toten Stämmchens von *Freycinetia Arnottii*. Hawai; Lauai: Mahana, VIII. 1910, leg. R o c k.

Im Titel habe ich diesen Pilz als Typus einer neuen den Parmulineen nahe stehenden Pyrenomyzetengattung bezeichnet. Man könnte ihn aber wohl mit demselben Rechte auch als eine neue, den Pyrenomyzeten nahe stehenden Parmulineen-Gattung bezeichnen, weil er ohne Zwang auch als vollständig eingewachsene Parmulinee aufgefasst werden könnte. Sein eigenartiger Bau wurde schon in der Beschreibung ausführlich geschildert. Erwähnt sei nur noch, dass der Pilz auf dem zahlreich vorliegenden Material fast nur in sehr jungem Zustande mit mehr oder weniger spindeligen, hyalinen Sporen vorhanden ist. Nur auf dem Holze konnten einige Fruchtkörper mit besser ausgereiften Schläuchen und olivbraunen Sporen gefunden werden.

Über Phacidium infestans Karst., einen gefährlichen Parasiten der Zirbelkiefer und einige andere in seiner Gesellschaft wachsende Pilze.

Von F. Petrak (Wien).

Mit 1 Textfig.

Mitte August dieses Jahres hat mir Herr Dr. O. Wettstein zahlreiche, an der Alpeggenleiten bei Obergurgl in Tirol zwischen 1900 und 2200 m von ihm gesammelte Zirbenäste gesendet, an denen fast alle Nadeln abgestorben und von einem Diskomyzeten befallen waren, dessen vollständig eingewachsene, grau durch die Epidermis der Nadeln schimmernde Apothezien sich als ganz unreif erwiesen. Die meisten Fruchtkörper enthielten keine Spur einer Fruchtschicht; nur vereinzelt konnten unreife Aszi ohne Sporen gefunden werden.

Auf Grund dieses Materiales war eine sichere Bestimmung des Pilzes nicht möglich. Ich war jedoch davon überzeugt, dass hier entweder *Phacidium infestans* Karst. oder eine damit nahe verwandte Art vorliegen müsse. Nachdem ich das oben erwähnte Material einige Tage gleichmässig feucht gehalten hatte, glückte es mir, auf einigen Nadeln reife Apothezien zu erhalten, deren Schläuche meist zwei bis 43/10 μ grosse oder 3—4 etwas kleinere Sporen enthielten, in bezug auf alle anderen Merkmale aber mit der typischen Form des *Ph. infestans* aus Schweden völlig übereinstimmten. Weil das Merkmal der nur 2—4, wesentlich grössere Sporen enthaltenden Schläuche konstant zu sein schien, war ich geneigt, den Pilz der Zirbelkiefer für eine, von dem auf *Pinus silvestris* vorkommenden *Ph. infestans* spezifisch verschiedene Art zu halten. Mit Rücksicht darauf, dass das Merkmal von 2—4- und oft auch das von vielsporigen Schläuchen bei vielen Pilzen nicht konstant ist, konnte ich mir über das *Phacidium* der Zirbelkiefer zunächst kein sicheres Urteil bilden, weil zur Feststellung der Konstanz oder Inkonstanz des erwähnten Merkmales möglichst zahlreiches, gut entwickeltes Material notwendig gewesen wäre. Meine Bitte, mir davon mehr zu schicken, hat Herr Prof. Wettstein an den Leiter der Wildbachverbauungsstation bei Obergurgl, Herrn Dr. Dipl.-Ing. H. Aulitzky, weitergeleitet. Der genannte Herr hat mir in dankenswerter Weise zwei grosse Sendungen mit ganz oder teilweise abgestorbenen Zirbenästen gesendet, auf denen *Phacidium* in unreifem Zustande massenhaft, auf einem grösseren Aste aber auch reichlich in guter Entwicklung vorhanden war. Nachdem ich davon schon über 100 Apothezien mit 2—4-sporigen

Schläuchen untersucht hatte, konnte ich auch einige Nadeln finden, auf denen nur Apothezien mit 8-sporigen Schläuchen vorhanden und von der typischen Form auf *Pinus silvestris* nicht zu unterscheiden waren. Von Herrn Prof. Wettstein habe ich dann noch drei reichhaltige Sendungen erhalten, von denen er die eine Ende August auf der Habachalpe bei Thomatal in Salzburg, die zweite am 1. September auf der Prankerhöhe in ca. 1800 m Höhe bei Stadl an der Mur, die dritte am 6. September auf dem Westhang über dem Vindo-

Fig. 1. Teilansicht der Alpeggenleiten bei Obergurgl in Tirol. Links ein schmaler Fussweg, weiter rechts ein dichter Bestand von *Vaccinium* und *Rhododendron*, an den sich ein Bestand von Zirben verschiedenen Alters anschliesst. Die am Rande befindlichen, kleinen Bäumchen zeigen an den hell gefärbten Nadeln deutlich die durch *Phacidium infestans* verursachten Schäden. Oben links die Hochgipfel der Ötztaler Alpen.

bonahaus bei ca. 1700 m am Radstädter Tauernpass gesammelt hat. Auch das Material dieser 3 Standorte war von dem meist ganz unreifen Parasiten befallen; auf einigen Ästchen von der Habachalpe waren aber auch prächtig entwickelte Apothezien mit 8-sporigen Schläuchen vorhanden. Nur ganz vereinzelt waren auch hier Fruchtkörper mit 2—4-sporigen Aszi vorhanden. Damit war die Identität des Zirbenpilzes mit *Ph. infestans* Karst. erwiesen. Über das Auftreten dieses, besonders den jungen Bäumen sehr gefährlich werdenden Parasiten haben mir die Herren Prof. Wettstein und Dr. Aulitzky ausführliche Mitteilungen zukommen lassen, denen ich Folgendes entnehmen möchte:

Der Pilz befällt nur jene Zirbenäste, die im Winter vom Schnee bedeckt werden, also vor allem junge Bäume. Sind diese so klein, dass sie ganz vom Schnee bedeckt werden, so sterben sie ganz ab, während bei älteren Bäumen nur die unter eine Schneedecke zu liegen kommenden Äste zugrunde gehen. Der stärkste Befall tritt auf den nach Süden gerichteten Teilen der Bäumchen in einer bestimmten Zone über dem Boden auf, deren Höhe von der Schneedecke in den Monaten April—Mai abhängt, was wahrscheinlich auf den Einfluss der gleichmässigeren Luftfeuchtigkeit und höheren Temperatur in den der Oberfläche nahen, im Frühjahr entstehenden Hohlräumen der die Bäume umgebenden Schneedecke zurückzuführen ist. In dieser Hinsicht zeigt das Auftreten des Phacidiums eine grosse Übereinstimmung mit *Herpotrichia juniperi* (Duby) Petr. = *H. nigra* Hart. und *Neopeckia Coulteri* (Peck) Sacc. Die Entwicklung des Pilzes scheint sehr langsam zu erfolgen. Während die im April des heurigen Jahres abgestorbenen Zweige nur eine gelb- oder rotbraune Verfärbung der Nadeln, aber keine Spur des Pilzes zeigen, sind die im Frühjahr 1954 abgestorbenen Nadeln weisslich grau verfärbt und mehr oder weniger reichlich mit den Apothezien des Parasiten besetzt. Herr Dr. Aulitzky hat in seinem Briefe an mich ausdrücklich darauf hingewiesen, „dass die tödlichen Schäden in der Zeit von 1953—55 noch nie so stark wie heuer aufgetreten sind; es ist auch sicher diesem von Jahr zu Jahr unterschiedlichen Auftreten zu danken, wenn Jungwüchse der Gefährdungszone überhaupt entwachsen können."

In Gesellschaft des Phacidiums treten gelegentlich auch noch andere Pilze auf, von denen einige nur auf den Nadeln, andere auf Nadeln und Ästen vorkommen. Da ich ein sehr zahlreiches Material in verschiedenen Entwicklungsstadien untersuchen konnte, soll *Ph. infestans* hier unter besonderer Berücksichtigung seiner Variabilität ausführlich beschrieben und auch die in seiner Begleitung auftretenden Pilze besprochen werden.

Phacidium infestans Karst.

Dieser Pilz wurde zuerst in Finnland gefunden und von Karsten in Hedwigia XXV. p. 232 (1886) beschrieben. Später konnte er auch in Skandinavien und im nördlichen Russland festgestellt werden, wo er besonders in der subarktischen Zone an jungen Föhrenbeständen grosse Schäden zu verursachen pflegt. Er wurde in neuester Zeit auch bei Ankara in der Türkei auf einer nicht näher bestimmten *Pinus*-Art gefunden und mir von Herrn Dr. H. Bremer zugesendet. Über diesen Fund habe ich schon in Sydowia VII. p. 29 (1953) kurz berichtet.

Nach der Überwinterung der im Vorjahre abgestorbenen Nadeln erscheinen auf ihnen zahlreiche, in der Längsrichtung meist etwas gestreckte, in lockeren oder ziemlich dichten Längsreihen hintereinander stehende, graue, unscharf begrenzte Flecken, die von der Deckschicht der sich unter der Epidermis entwickelnden jungen Apothezien verursacht werden. In diesem Stadium der Entwicklung stellen sie einen oben flachen oder nur sehr schwach konvexen, ca. 70 bis 160 μ dicken, oben fest mit der Epidermis verwachsenen Gewebspolster dar, der aus meist etwas wellig gekrümmten, mehr oder weniger senkrecht verlaufenden, zuweilen fast parallelen, ca. 4—6 μ breiten, ziemlich kurzgliederigen, miteinander verwachsenen, zartwandigen, sehr inhaltsreichen, hyalinen Hyphen besteht. Oben färben sich diese Hyphen allmählich dunkler und gehen in eine meist ca. 20—30 μ, seltener bis ca. 60 μ dicke Deckschicht über, die gegen den Rand allmählich dünner wird und aus rundlich eckigen, 3.5—6 μ grossen, ziemlich dickwandigen, auch in die Epidermis eindringenden Zellen besteht. An einer ungefähr in der Mitte befindlichen, oft aber auch mehr oder weniger exzentrischen Stelle von ca. 90—130 μ Durchmesser wird die Epidermis schon frühzeitig schwach konvex vorgewölbt, ganz unregelmässig zersprengt und schollig abgeworfen. In diesem, keine Spur einer Fruchtschicht zeigenden Jugendstadium scheint der Pilz lange zu verharren. Manche Anzeichen, vor allem der Umstand, dass sich auf vielen Ästen die Apothezien nicht weiter entwickeln und durch Auflösung des sterilen, senkrecht hyphigen Gewebes in eine schleimige, feinkörnige Masse zugrunde gehen, scheinen dafür zu sprechen, dass der Pilz nur unter ganz bestimmten Vegetationsbedingungen die volle Reife erlangen und Sporen ausreifen kann.

Am Beginn der Reife wird die Deckschicht mit der ihr fest anhaftenden Epidermis stark pustelförmig vorgewölbt und bald durch mehrere unregelmässig radiäre Risse in einige, sich gegen den Rand zurückbiegende oder einrollende Lappen zersprengt, so dass die flach konvexe, hell grauviolette oder rötlichgraue Fruchtschicht entblösst wird. Die Basis des Apotheziums zeigt keine Differenzierung in Hypothezium und Aussenkruste. Sie besteht aus einer ca. 15—25 μ, in der Mitte zuweilen bis ca. 60 μ dicken Schicht von rundlich eckigen, relativ dickwandigen, inhaltsreichen, 3—6 μ grossen, hyalinen Zellen, die unten stets von mehr oder weniger zahlreichen, grösseren oder kleineren, ganz verschrumpften, rostgelb oder orangerot verfärbten Substratresten durchsetzt ist und sich in spärliche, tiefer in das Mesophyll eindringende, zartwandige, undeutlich septierte, sehr locker verzweigte, hyaline oder subhyaline, 1.5—3 μ dicke Hyphen auflöst.

Aszi zylindrisch-keulig, parallel stehend, oben breit abgerundet, unten in einen ca. 10—15 μ, selten bis ca. 25 μ langen, ziemlich

dicken, knopfig endenden Stiel verjüngt, oft nur 2—4-sporig, p. sp. dann 60—90 μ lang, 11—14 μ dick oder 8-sporig, p. sp. 80—130 μ, seltener bis 150 μ lang, 12—18 μ dick. Sporen ein-, in den 8-sporigen Schläuchen unvollständig zweireihig, gestreckt ellipsoidisch, beidendig stumpf abgerundet, kaum oder schwach, zuweilen aber auch stärker verjüngt, dann länglich spindelförmig oder etwas keulig, gerade oder ungleichseitig, seltener schwach gekrümmt, hyalin, mit homogenem, feinkörnigem Plasma und deutlich sichtbarem, fast 0.5 μ dickem Epispor, in den 2—4-sporigen Schläuchen 28—36 μ, selten bis 43 μ lang, 6—10 μ dick, vereinzelt aber auch viel kleiner und dann nur ca. 16 ⇌ 5 μ gross, in den 8-sporigen Schläuchen 15—26 μ lang, 5—7.5 μ, selten bis 10 μ breit. Paraphysen spärlich, fädig, meist einfach, 1.5—3 μ dick, oben kein Epithezium bildend.

Mehrere, von mir zum Vergleich herangezogene Kollektionen von typischem *Ph. infestans* auf *Pinus silvestris* zeigten in bezug auf Aszi und Sporen keine Unterschiede. Die Basalschicht der Apothezien war aber im Durchschnitt etwas dünner, nicht über 20 μ dick, aussen nicht von verschrumpften Substratresten durchsetzt und stets sehr scharf begrenzt, was aber wohl darauf zurückzuführen ist, dass die Nadeln von *P. silvestris* in bezug auf ihren anatomischen Bau von denen der Zirbelkiefer wesentlich verschieden sind.

Dasyscypha flavovirens Bres.

Auf einigen, von *Phacidium infestans* befallenen Ästchen der Kollektion aus Salzburg und von Obergurgl war ein schöner, durch die lebhaft dottergelbe oder hell orangerote Fruchtscheibe auffälliger Diskomyzet mit kurz gestielten, aussen dicht mit ziemlich geraden, septierten, feinpunktiert-rauhen, dunkelbraunen, bis ca. 8 μ breiten Haaren besetzten Apothezien zur Entwicklung gelangt. Aszi keulig-zylindrisch, oben breit abgerundet, unten in einen kurzen, wohl nie über 20 μ langen Stiel verjüngt, 8-sporig, p. sp. ca. 50 μ lang, 6—9 μ breit. Sporen ein- selten sehr undeutlich zweireihig, ellipsoidisch oder länglich eiförmig, beidendig breit abgerundet, kaum oder nur unten schwach verjüngt, hyalin, einzellig, mit homogenem, sehr feinkörnigem Plasma, 6—12 μ, vereinzelt bis 12 μ lang, 3.5—5 μ breit, Paraphysen sehr zahlreich, fädig, ziemlich steif und meist ganz gerade, einfach, selten gabelig geteilt, viele kleinere und grössere, gelbbräunliche Öltröpfchen enthaltend, 2—3.5 μ breit, die Aszi ziemlich weit überragend.

Dieser Pilz ist ohne Zweifel mit *D. flavovirens* Bres. identisch, die von Bresadola und Rehm auf Lärchenästen in Tirol, von Fischer in der Schweiz gesammelt wurde. Er wurde von Petrak und Sydow in Annal. Mycol. XX. p. 200 (1922) mit *D. arida* (Phill.) Sacc. identifiziert. In demselben Sinne habe ich mich auch in Krypt.

Forsch. Bayer. Bot. Ges. Erforsch. heim. Flora II. Nr. 2, p. 178 (1931) geäussert und darauf hingewiesen, dass die Farbe des Apotheziums bei vielen Diskomyzeten sehr veränderlich ist. Jetzt habe ich zwei Exemplare aus Nordamerika zum Vergleich herangezogen, — europäisches Material von *D. flavovirens* habe ich früher nicht untersuchen können — von denen das eine auf *Abies balsamea* in Kanada, das andere auf *Abies concolor* in Kalifornien gesammelt wurde. Habituell lässt sich der amerikanische Pilz von dem auf *P. cembra* in keiner Weise, mikroskopisch jedoch auf den ersten Blick unterscheiden. Die Kollektion aus Kanada hat deutlich kleinere, nämlich p. sp. ca. 40 μ lange, 5—6 μ breite Aszi, deren Stiel bis ca. 30 μ lang werden kann; die länglich-ellipsoidischen Sporen sind nur 5—6.5 ⇌ 3—4 μ gross. Die nur sehr spärlich vorhandenen Paraphysen sind kaum oder nur wenig länger als die Aszi, und enthalten nur spärliches, feinkörniges Plasma, selten auch einzelne sehr kleine Öltröpfchen. Deshalb ist die ganze Fruchtschicht auf Querschnitten völlig hyalin, bei dem Pilze auf *Pinus cembra* jedoch gleichmässig rostgelb oder hell orangerot gefärbt. Der kalifornische Pilz stimmt mit der kanadischen Kollektion völlig überein, hat aber etwas zahlreichere, die Schläuche oft ein wenig überragende, sich oben oft bis auf ca. 3 μ verbreiternde Paraphysen.

Mit Rücksicht auf die bei dem amerikanischen Pilze weniger zahlreichen, meist kürzeren und etwas dünneren Paraphysen, die kleineren, relativ länger gestielten Aszi und die kleineren Sporen muss *D. arida* (Phill.) Sacc. als von *D. flavovirens* Bres. verschieden erachtet werden. Dass beide Arten miteinander nahe verwandt sind, kann keinem Zweifel unterliegen; da Übergangsformen nicht vorzukommen scheinen, müssen sie als voneinander hinreichend verschieden aufgefasst werden.

Pleurodiscus Wettsteinii Petr. n. spec.

Stromata laxissime dispersa, plerumque solitaria, subepidermalia, mox erumpentia et quasi superficialia, ambitu subglobosa vel late ovoidea, saepe obtuse angulosa et superne plus minusve applanata, tunc plerumque omnino irregularia, in sicco collabascentia, in humido intumescentia et multo majora, tunc ca. 250—400 μ diam., omnino clausa in maturitate ad apicem irregulariter dilabentia, loculo unico, maximo, irregulariter multilobato vel loculis compluribus minoribus, indistincte distichis, plus minusve globosis vel irregularibus, majoribus plus minusve lobatis praedita; pariete ad basin ca. 12—20 μ, raro usque ad 35 μ crasso, contextu carnoso-gelatinoso, pseudoparenchymatico, e cellulis rotundato-angulosis, pro ratione crassiuscule tunicatis, hyalinis, vix compressis, 3.5—6.5 μ diam. metientibus composito; pariete ad latera ca. 12—30 μ, in vertice usque

ad 50 μ crasso, contextu carnoso-gelatinoso, pseudoparenchymatico, e cellulis rotundato-angulosis, plus minusve compressis, pallide ferrugineo- vel aurantiaco-flavidis, crassiuscule tunicatis, usque ad 10 μ diam. metientibus composito, extus cum epidermidis reliquiis majoribus minoribusve arte connato; conidia mucoso-conglutinata, acrogena, breviter bacillaria, utrinque obtusiuscula nec attenuata, recta, raro curvula, continua, hyalina, 3—3.5 μ, raro usque ad 4 μ longa, ca. 1 μ crassa; conidiophora totam loculorum superficiem interiorem obtegentia, densissime stipata, subulato-filiformia, rarissime simplicia, tunc usque ad 30 μ longa, apicem versus paulatim attenuata, inferne ca. 2—2.5 μ crassa, sero mucosa.

Auf abgestorbenen Nadeln und Ästen von *Pinus cembra.* — Tirol: auf der Alpeggenleiten bei Obergurgl in Tirol, ca. 1900—2200 m, VIII. 1955, leg. O. Wettstein.

Diese schöne, ihrem Entdecker zu Ehren benannte Parasphaeropsidee habe ich auf einigen Nadeln und Ästchen der von *Phacidium infestans* befallenen Kollektion gefunden. Sie stimmt mit der Typusart *P. gregarius* Petr. in Krypt. Forsch. Bayer. Bot. Ges. Erforsch. heim. Flora II. Nr. 2, p. 188 (1931) gut überein und unterscheidet sich von ihr der Hauptsache nach durch die mehr oder weniger rundlichen, nicht niedergedrückt polster- oder scheibenförmigen Fruchtkörper und durch die kleineren, meist geraden, nur selten schwach gekrümmten Konidien.

Die oben mitgeteilte Beschreibung bezieht sich auf die Form, die auf den Nadeln wächst. Die auf den Ästen wachsende Form stimmt zwar in bezug auf die Beschaffenheit der Träger und Konidien mit dem Typus völlig überein, ist davon aber durch den Bau der Fruchtkörper ganz verschieden und soll hier noch etwas ausführlicher beschrieben werden:

Stromata locker oder ziemlich dicht zerstreut, bisweilen zu zwei oder mehreren dicht beisammen oder hintereinander stehend, dem Rindenparenchym vollständig und tief eingewachsen, das deckende Periderm zersprengend und oft bis zum Rande abwerfend, am Scheitel daher mehr oder weniger frei werdend, aber nicht vorragend, unregelmässig ei- oder knollenförmig, meist ca. 600—900 μ hoch, 350—600 μ breit, mit mächtig entwickeltem, in der Mitte ca. 300—500 μ hohem Basalstroma von völlig hyalinem, nur aussen und in dickeren Schichten sehr hell gelblich gefärbtem, am Grunde mehr oder weniger typisch prosenchymatischem Gewebe. Weiter oben strecken sich die Zellen, sind dann meist 6—15 μ, selten bis 20 μ lang, 3.5—6.5 μ breit und bilden senkrecht parallele, oft etwas gekrümmte Reihen. Am Scheitel sind die Fruchtkörper ziemlich scharf abgestutzt und haben eine sehr unregelmässig faltig-furchige Oberfläche. Lokuli meist einschichtig, in der Regel nur an den Seiten auch noch mit einzelnen

etwas tiefer stehenden Lokuli. Konidien und Träger wie bei der typischen Form auf Nadeln.

Wie man sieht, unterscheidet sich die Astform wie bei vielen anderen, auf Ästen und Blättern ihrer Matrix wachsenden Pilzen von der auf Nadeln wachsenden Form nur durch das mächtig entwickelte, tief eingewachsene, das Hervorbrechen des Fruchtkörpers unterstützende Basalstroma.

Lophodermium pinicolum Tehon.

Von den zahlreichen, abgestorbenen Zirbenästen, die mir von den oben genannten Standorten aus Tirol und Salzburg zugesendet wurden, waren mehrere nur spärlich von *Lophodermium pinicolum* aber reichlich von dessen Nebenfruchtform *Leptostroma pinastri* Desm. befallen. Besonders auffällig war der Umstand, dass sich *Lophodermium* und *Phacidium* stets streng getrennt von einander, aber nie auf denselben Ästen entwickelt hatten. Wahrscheinlich sind die Vegetationsbedingungen dieser Pilze so verschieden, dass sich stets nur einer von ihnen entwickeln kann.

In Univ. Illin. Bull. XXXII. Nr. 31 (1935) hat Tehon eine monographische Revision der *Lophodermium* veröffentlicht und dort darauf hingewiesen, dass die Matrix von Chevallier's Originalexemplar des *Lophodermium pinastri* (Schrad.) Chev. in Roumeguère's Fungi gall. exs. Nr. 1661 nicht *Pinus silvestris*, sondern *Abies pectinata* ist. Deshalb bezeichnet Tehon l. c. p. 308 das *Lophodermium piceae* (Fuck.) v. H. auf *Picea* und *Abies* als *Lophodermellina pinastri* (Chev.) v. H. und nennt l. c. p. 285 den Pilz auf *Pinus Lophodermium pinicolum* Tehon. Weil aber die Gattung *Lophodermellina* neben *Lophodermium* nicht aufrecht gehalten werden kann, müsste jetzt nach Tehon's Vorgang der *Pinus*-Pilz als *L. pinicolum* Teh. bezeichnet werden, während die Art auf *Abies* und *Picea* den bisher von den meisten Autoren für den Pilz auf *Pinus* angewendeten Namen *L. pinastri* (Schrad.) Chev. erhalten müsste. Hier zeigt sich wieder einmal, zu welchen absurden Folgerungen die unlogische Anwendung der heute geltenden, von den verschiedenen Autoren ganz verschieden interpretierten „Nomenklaturregeln" führen können. Auch die bei *Macrophoma, Glocosporium, Venturia* und vielen anderen Mischgattungen in der mykologischen Literatur zur nomenklatorischen Klarstellung derselben angewendeten „Regeln" zeigen, welche Konfusionen und widersprechende Lösungen dabei herauskommen können.

Chevallier's Name, der zu Irrtümern Anlass geben müsste, ist ganz aufzugeben. Deshalb hat jetzt der Pilz auf *Pinus L. pinicolum* Tehon zu heissen, während die auf *Abies* und *Picea* wachsende Art als *L. piceae* (Fuck.) v. H. eingereiht werden muss.

Dothichiza pityophila (Cda.) Petr. und **Cytospora pinastri** Fr.

Auf einigen Zirbenästen von der Habachalpe waren auch die beiden oben genannten Pilze vorhanden, aber schon ganz alt oder überreif. Sie waren zum Teile auf Nadeln desselben Zweiges, zum Teile aber auch jeder für sich auf verschiedenen Ästchen, jedoch nie mit *Phacidium* vergesellschaftet anzutreffen. *D. pithophila* ist ein auf vielen *Picea-*, *Abies-* und *Pinus*-Arten sehr weit verbreiteter und häufiger Pilz, der sich besonders üppig in Holzschlägen auf den Nadeln der in grünem Zustande von den gefällten Bäumen abgehauenen, einige Zeit liegen bleibenden Ästen entwickelt. Ähnlich verhält sich auch *Cytospora pinastri* Fr. Manche Anzeichen scheinen dafür zu sprechen, dass diese beiden Pilze gelegentlich auch als Schwächeparasiten auftreten können.

Zuletzt sei noch erwähnt, dass ich auf dem überaus zahlreichen Zirbenmaterial der oben genannten Fundorte noch mehrere andere Pilze gefunden habe. Diese waren aber leider noch ganz unreif und konnten deshalb nicht sicher identifiziert werden.

Phacostroma n. gen., eine neue Gattung der Melanconieen.

Von F. Petrak (Wien).

Phacostroma Petr. n. gen.

Acervuli dispersi, minores lenticulares, ambitu orbiculares vel elliptici, majores corpusculum centrale stromaticum sterile prosenchymaticum, atro-olivaceum circulariter circumdantes; hypostromate crasso, contextu accurate prosenchymatico, olivaceo, superne peridermio plus minusve pustulatim elevato, in maturitate irregulariter disrumpente tecti; conidia oblongo-fusoidea vel fusoideo-clavata, plerumque recta, hyalina, continua; conidiophora totam hypostromatis superficiem superiorem obtegentia, longiuscula, minora simplicia, majora plerumque furcata, sero mucosa.

Fruchtkörper zerstreut, die kleineren aus rundlichem Umriss linsenförmig, mit mächtig entwickeltem, olivbraunem, prosenchymatischem Basalstroma, oben nur von dem pustelförmig vorgewölbten Periderm bedeckt, die grösseren kreisringförmig ein schwarzbraunes, zylindrisches, steriles, prosenchymatisches Zentralstroma umgebend. Konidien akrogen, länglich-spindelförmig, seltener spindelig-keulig, meist gerade, einzellig, hyalin, 13.5 ⇌ 5 μ. Konidienträger die ganze Oberfläche des Basalstromas überziehend, fädig und ziemlich lang, die kürzeren einfach, die längeren oft gabelig geteilt, erst später verschleimend.

Phacostroma hypodermium Petr. n. spec.

Acervuli irregulariter et plerumque laxe dispersi, minores lenticulares, ambitu orbiculares vel late ellipsoidei, 350—600 μ, raro usque ad 800 μ diam., in centro ca. 300—500 μ crassi, majores usque ad 1.5 mm diam., corpusculum centrale stromaticum, sterile, prosenchymaticum, atro-olivaceum circulariter circumdantes, peridermio plus minusve pustulatim elevato, in maturitate irregulariter disrumpente tantum tecti; hypostromate crasso, contextu inferne pseudoparenchymatico, e cellulis plus minusve isodiametricis, ca. 5—16 μ diam. metientibus, crassiuscule tunicatis, irregulariter angulosis atro-brunneis composito, superne in contextum prosenchymaticum e cellulis verticaliter manifeste elongatis, 7—20 μ longis, 4—10 μ latis, tenuiter tunicatis, paulatim pallidioribus, denique brunneolis vel subhyalinis et minoribus compositum transeunte; conidia numerosissima, mucoso-conglutinata, oblongo-fusoidea vel fusoideo-cla-

vata, raro fere cylindracea, recta, raro inaequilatera vel curvula, hyalina, continua, 10—17 ⇌ 3.5—6 μ; conidiophora totam hypostromatis superficiem obtegentia, densissime stipata, longiuscula, crassiuscule filiformia, minora simplicia, majora plerumque furcata, 20—40 ⇌ 1.5—2.5 μ, sero mucosa.

Fruchtkörper mehr oder weniger weitläufig, locker und ziemlich unregelmässig, seltener dicht zerstreut, meist einzeln, bisweilen aber auch zu zwei oder mehreren dicht beistammenstehend, dann oft auch etwas verwachsen, sich unter dem Periderm entwickelnd, dem Rindenparenchym auf- oder auch etwas eingewachsen, aus rundlichem oder breit elliptischem Umriss ziemlich dick linsenförmig, je nach Grösse in zwei verschiedenen Formen auftretend. Bei der kleineren Form haben die Fruchtkörper meist einen Durchmesser von 350—600 μ, selten bis ca. 800 μ und sind in der Mitte ca. 300—500 μ hoch. Das Basalstroma ist sehr verschieden, meist ca. 130—250 μ hoch, in der Mitte oft flach konvex vorgewölbt und hier bis ca. 350 μ hoch; seine unterste, ca. 30 μ dicke Schicht ist pseudoparenchymatisch und besteht aus 5—12 μ, seltener bis 16 μ grossen, mehr oder weniger isodiametrischen, unregelmässig eckigen, etwas dickwandigen, schwarzbraunen Zellen; aussen ist sie sehr fest mit verschrumpften Substratresten verwachsen und löst sich dort, wo kleine Hohlräume vorhanden sind in kurze, mehr oder weniger stark gekrümmte, verzweigte, olivbraune, ca. 3—4 μ breite Hyphen auf. Oben geht dieses pseudoparenchymatische Gewebe sehr rasch in ein dickes Prosenchym über, das aus senkrecht parallelen Reihen von 7—20 μ langen, 4—7 μ, seltener bis ca. 10 μ breiten, dünnwandigeren, sich oben allmählich heller färbenden und schmäler werdenden Zellen besteht. Die oberste Schicht ist am Rande ca. 30—45 μ, in der Mitte bis ca. 80 μ dick, streng prosenchymatisch, besteht aus relativ kürzeren, hell gelbbräunlichen, sehr inhaltsreichen Zellen und löst sich oben allmählich in die hyalinen Konidienträger auf. Aussen geht das Basalstroma in einen sehr allmählich dünner werdenden, oben mit dem Periderm fest verwachsenen, bis ca. 350 μ breiten, sterilen, ebenfalls streng prosenchymatisch gebauten Rand über. Nicht unwesentlich verschieden ist die zweite Form der Fruchtkörper. Diese sind stets grösser und können vereinzelt bis ca. 1.5 mm Durchmesser erreichen. In ihrer Mitte ist ein steriler, gestutzt kegelförmiger oder fast zylindrischer, ca. 100—140 μ dicker Stromakörper vorhanden, durch welchen oben das Periderm zersprengt und zum grössten Teil abgeworfen wird. Es entsteht so ein rundliches Loch, durch welches der schollig krümelige Scheitel des Zentralstromas entblösst wird. Der einen mehr oder weniger vollständigen Kreisring bildende Lokulus umgibt das zentrale, sterile Stroma; er besitzt ebenfalls einen linsenförmigen Querschnitt, ist aber oft etwas schief, weil er dem Zentralstroma mit

breiter Fläche aufliegt und von ihm gleichsam emporgehoben wird. Konidien massenhaft, länglich-spindelförmig, beidendig stumpf und mehr oder weniger, unten oft etwas stärker verjüngt, dann etwas keulig, vereinzelt auch fast zylindrisch, gerade, selten ungleichseitig oder schwach gekrümmt, hyalin, einzellig, 10—17 μ, meist ca. 12—14 μ lang, 3.5—6 μ, selten bis 6.5 μ breit, akrogen entstehend. Konidienträger die ganze Innenfläche des Basalstromas überziehend, sehr dicht stehend, ziemlich dickfädig, sehr verschieden, meist ca. 20—30 μ, selten bis ca. 40 μ lang, nach oben schwach aber meist deutlich verjüngt, die kürzeren einfach, die längeren meist gabelig geteilt, unten 1.5—2.5 μ dick, sehr spät verschrumpfend und verschleimend.

Auf dürren, nicht ausgereiften Stocktrieben eines Baumstrunkes von *Ulmus* spec.: Mähren: untere Höllenschlucht bei Podhorn nächst Mähr.-Weisskirchen. X. 1925, leg. F. Petrak.

Der hier beschriebene, prächtig entwickelte, durch den Bau des Basalstromas und die langen, oft ästigen Träger gut charakterisierten Pilzes, dessen grössere Form man kurz als „valsoide Melanconiee" bezeichnen könnte, ist eine Nebenfruchtform von *Cryptosporella hypodermia* (Fr.) Sacc. Weil dieser Schlauchpilz auf dürren, noch hängenden *Ulmus*-Ästchen häufig anzutreffen ist, hielt ich es für sehr wahrscheinlich, dass auch seine Nebenfruchtform schon lange bekannt sein könnte. Meine Vermutung, dass *Myxosporium ulmi* (Oud.) Sacc., dessen Beschreibung ganz gut auf den von mir gefundenen Pilz zu passen scheint, damit identisch sei, wurde durch die Untersuchung des mir von Herrn Prof. Dr. B. v. d. Wyk, Direktor des Botanischen Laboratoriums der Universität Groningen in dankenswerter Weise zur Verfügung gestellten Originalexemplares nicht bestätigt. Über diesen, dem *Phacostroma hypodermium* Petr. in mancher Hinsicht ähnlichen, aber doch wesentlich verschiedenen Pilz werde ich bei einer anderen Gelegenheit noch ausführlicher berichten.

Beiträge zur Pilzflora von Süd- und Ostasien

Von F. Petrak (Wien).

Amazonia toquian Petr. n. spec.

Plagulae amphigenae sed plerumque in epiphyllo, sine maculis, nunc solitariae, nunc laxe vel subdense dispersae, interdum, plus minusve confluentes et magnam folii partem occupantes, ambitu irregulares, sinuosae et angulosae, 3—10 mm diam., confluendo etiam majores; mycelium ex hyphis plerumque rectis, raro parum undulatis, remote et indistincte septatis, fere opace atro-brunneis, crassiuscule tunicatis, in plagularum margine alternatim, raro opposite furcatis, in centro dense reticulato-ramosis et membranam tenuissimam continuam efformantibus, ca. 7—12 μ crassis compositum; hyphopodia pauca, quoad formam et magnitudinem variabilia, plerumque depresso-hemisphaerica, raro fere pulvinata, ellipsoidea vel ovoidea, 5—20 ⇌ 10—22 μ; stromata in plagulis minoribus solitaria, in earum centro oriunda, in plagulis majoribus laxe dispersa nec aggregata, e basi orbiculari 400—800 μ diam. metiente conica, ca. 300—350 μ alta, primum clausa, denique in verticis centro dilabentia et plus minusve late infundibuliformiter aperta; strato tegente e mycelio oriundo, centrum ascomatis versus paulatim crassiore, in vertice usque ad 80 μ crasso, contextu carbonaceo-fragili, probabiliter e cellulis angulosis, 6—13 μ diam. metientibus, opace atro-brunneis composito; perithecia sub strato tegente nidulantia, plus minusve globosa, vix vel parum depressa, ca. 200—400 μ diam.; pariete ca. 25 μ crasso, membranaceo, gelatinoso-carnoso, contextu subhyalino, concentrice fibroso; asci subnumerosi, irregulariter ad maturitatem pervenientes, primum late ovoidei vel ellipsoidei, postea plus minusve elongati, crassiuscule tunicati sed facile diffluentes, antice late rotundati, postice parum attenuati vel contracti, 4-spori, ca. 100—120 ⇌ 40—50 μ; sporae conglobatae vel indistincte tristichae, oblongo-clavatae, utrinque late rotundatae, superne vix vel parum, inferne paulatim attenuatae, rectae vel curvulae, 3-septatae, ad septum supremum vix vel indistincte, ad medium distincte, ad infimum plerumque valde constricte, fere opace atro-brunneae, 53—70 ⇌ 18—22 μ; paraphysoides numerosae, late fibrosae, tenuiter tunicatae, 2—3.5 μ crassae, facile viescentes, mox omnino mucosae.

Auf lebenden Blättern von *Ternstroemia toquian.* Philippinen: Mt. Arayat, Pampanga Prov., Luzon, 31. X. 1925, leg. M. S. Clemens Nr. 7197; ebendort, II. 1923, leg. M. S. Clemens Nr. 218.

An den Stellen, wo sich die Perithezien entwickeln, wird das darunter befindliche Blattgewebe deutlich angegriffen. Zwischen den mehr oder weniger gebräunten Zellen des Mesophylls sind zartwandige, ca. 2—3.5 μ breite, sehr locker verzweigte, hyaline Hyphen vorhanden, die wohl ein intramatrikales Myzel des Pilzes repräsentieren dürften, was sich aber auf Grund des schlechten, meist ganz alten Materials nicht mit Sicherheit behaupten lässt.

Zwischen den Netzmaschen der primären Hyphen werden die frei bleibenden Zwischenräume durch stärker, oft fast mäandrisch gekrümmte, etwas schmälere, meist nicht über 8 μ breite Hyphen ausgefüllt, so dass eine dünne, matt schwarze, der Epidermis nur locker anhaftende, zusammenhängende Kruste von ziemlich brüchiger Beschaffenheit entsteht, unter der sich die Fruchtkörper entwickeln.

Der prächtige, leider fast nur in ganz altem oder überreifem Zustande vorliegende Pilz ist in mehrfacher Hinsicht, besonders durch die Form der sehr grossen Sporen sehr ausgezeichnet und lässt sich schon durch den völligen Mangel der Myzelborsten von der auch durch grosse Sporen charakterisierten *A. clusiae* Stev. leicht unterscheiden.

Anthostomella livistonae Girzitska in Mat. Myc. Phytop. VIII./1. p. 101 (1929). — Auf abgestorbenen Blättern von *Livistona chinensis*. China: Canton College, Kwangtung, 12. V. 1919, leg. O. A. Reinking Nr. 5705. — China: ohne nähere Angaben, 1920/21, leg. C. W. Howard. — Ob der mir vorliegende Pilz mit *A. livistonae* wirklich identisch ist, lässt sich mit Rücksicht auf die kurze, sehr unvollständige Beschreibung nicht mit Sicherheit behaupten. Auf den beiden, oben angeführten Kollektionen wachsen die Perithezien weitläufig, ziemlich gleichmässig und dicht zerstreut. Sie sind dem Mesophyll eingewachsen, 200 μ gross, rundlich, nicht oder nur schwach niedergedrückt, oft etwas unregelmässig, oben von einem schwarzbraunen, etwas glänzenden, ziemlich unscharf begrenzten, epidermalen Klypeus bedeckt, der von dem flachen, ziemlich dicken, breit abgesetzt kegelförmigen Ostiolum durchbohrt wird. Die länglichen oder ellipsoidischen Sporen sind beidendig sehr breit abgerundet, nicht verjüngt, gerade, selten etwas ungleichseitig, durchscheinend schwarzbraun, von 2 Seiten stark zusammengedrückt, 7.5—12 μ, selten bis 13 μ lang, 5.5—7 μ, in der Seitenansicht 3—4.5 μ breit.

Wie man sieht, zeichnet sich der chinesische Pilz durch einige Merkmale aus, die in der Beschreibung der Autorin nicht erwähnt werden; deshalb lässt sich seine Identität nicht mit Sicherheit behaupten.

Balladyna Sydowii Petr. n. spec.

Plagulae, ut videtur, semper hypophyllae, obscure brunneae vel nigrescentes, sat bene vel indistincte limitatae, ambitu orbiculares vel ellipticae, saepe sinuosae et lobatae, tunc plus minusve irregulares, primo irregulariter et laxe dispersae, postea accrescentes et saepe magnam folii partem occupantes; mycelium ex hyphis dense irregulariterque ramosis, subrectis vel parum curvulis, pallide olivaceis, indistincte et remote septatis, 3—4.5 μ latis compositum; hyphopodia pauca, interdum fere nulla, subglobosa, crasse pulvinata vel oblonga, continua, 3.5—6 ⇌ 3—5 μ; setae mycelicae nunc paucae, nunc subnumerosae, e basi saepe bulbiformiter incrassata subtortuosae, fere opace atro-brunneae, apicem versus plus minusve attenuatae et saepe pallidiores, ca. 35—50 μ longae, ab basin 5—6.5 μ crassae; perithecia subgregaria, sessilia, raro brevissime stipitata, globosa vel late ovoidea, in vertice saepe obtuse depresso-conica, 27—42 μ diam.; pariete ca. 5—6 μ crasso, molliter membranaceo, pseudoparenchymatico, e strato unico cellularum rotundato-angulosarum, pallide olivacearum vel griseo-brunnearum, pro ratione crassiuscule tunicatarum, 3.5—6 μ diam. metientium composito; asci 1—2, rarissime 3 in quoque perithecio subglobosi vel late ovoidei, sessiles, crasse tunicati, 8-spori, 23—30 ⇌ 13—24 μ vel ca. 23—28 μ diam., aparaphysati; sporae conglobatae, oblongae, utrinque rotundatae, non vel postice tantum lenissime attenuatae, rectae vel inaequilaterae, medio septatae, vix vel leniter constrictae, diu hyalinae, denique dilutissime brunneolae, 10—14 ⇌ 5—6.5 μ.

Auf lebenden Blättern von *Neonauclea Bartlingii.* Philippinen, Luzon; Baguio, Benguet Prov. VI. 1923, leg. M. S. Clemens. — Auf *Neonauclea Vidalii,* ebendort, XII. 1925, leg. M. S. Clemens.

Diese schöne, durch ihre kleinen Perithezien und Sporen ausgezeichnete Art wächst oft, aber nicht immer, in den Rasen einer Meliolinee und scheint darauf zu parasitieren; sie wurde in meiner Mycotheca generalis unter Nr. 1714 ausgegeben. Die kleinen Perithezien enthalten meist nur einen Askus, die grösseren zwei, sehr selten auch drei Schläuche. *Balladynopsis* kann daher neben *Balladyna* Rac. nicht aufrecht gehalten werden und ist als ein Synonym davon zu erachten.

Calosphaeria striaeformis Petr. n. spec.

Stromata subdense dispersa, plerumque series longitudinales, parallelas formantia, anguste striaeformia, 0.5—2 mm longa, 200—350 μ lata, confluendo etiam longiora, primo tecta, tandem epidermide pustulatim elevata rimula longitudinali, rectiuscula disrupta erumpentia sed numquam prominula; perithecia seriatim disposita, plus minusve stipata et connata, globosa vel ovoidea, e mutua pressione

plus minusve applanata et irregularia, 120—200 μ diam., ostiolo breviter et crassiuscule cylindraceo-conico, poro ca. 16 μ lato perforato praedita; pariete 15—20 μ crasso, subcarbonaceo, contextu pseudoparenchymatico, e cellulis fere opace atro-brunneis, irregulariter angulosis, tenuiter tunicatis, vix compressis, 4—6 μ diam. metientibus composito; asci numerosissimi, clavati, antice truncato-rotundati, postice paulatim attenuati, 2—4 in stipite communi ramoso oriundi, 8-spori, 18—24 ⇌ 5—6 μ; sporae plus minusve distichae, bacillari-allantoideae, utrinque obtusae nec attenuatae, hyalinae, continuae, 4—6.5 ⇌ 1—1.5 μ; metaphyses paucae, fibrosae, tenuiter tunicatae, ca. 1 μ diam., mox viescentes et mucosae.

Auf faulenden Halmen einer Bambusee. Philippinen: Mt. Maquiling bei Banos, Prov. Laguna, Luzon, XII. 1919, leg. G. O. O c f e m i a.

Wie bei vielen anderen auf Bambuseen wachsenden, stromatischen Pyrenomyzeten sind auch bei dem oben beschriebenen Pilze die Stromata in der Längsrichtung des Substrates stark gestreckt und bilden sehr schmale, meist ganz gerade, in der Mitte durch einen zarten Längsspalt der Epidermis aufreissende Streifen.

Lembosia rizalensis Petr. n. spec.

Mycelium semper epiphyllum, plus minusve late extensum, interdum fere totam folii superficiem occupans, tenuissimum, etiam sub lente vix conspicuum, ex hyphis laxe et irregulariter ramosis plus minusve undulato-curvulis, remote et indistincte septatis, crassiuscule tunicatis, 2.5—4 μ, raro usque ad 5 μ crassis compositum; hyphopodia pauca vel subnumerosa, plerumque alternantia, quoad formam variabilissima, nunc pulvinata vel disciformia, 3—4 μ alta, 5—8 μ lata, nunc plus minusve protracta, cylindracea, ellipsoidea, clavata vel obtuse conica, interdum e basi plus minusve dilatata, apicem versus contracta vel attenuata, tunc obliqua vel fere uncinato-curvula, latiora interdum sinuosa vel lobulata, continua, hyphis obscurius colorata, 5—10 μ, raro usque 12 μ longa, 3.5—6 μ lata; ascomata laxissime et irregulariter dispersa, plerumque solitaria, raro bina complurave plus minusve aggregata, tunc saepe V- vel Y-formiter connata, ambitu anguste et elongato-elliptica vel breviter striiformia, utrinque rotundata vix vel parum attenuata, recta, raro inaequilatera vel leniter arcuato-curvula, 150—400 ⇌ 80—130 μ; strato basali gelatinoso-carnoso, ca. 5—9 μ crasso, contextu pseudoparenchymatico, e cellulis rotundato-angulosis, pro ratione crassiuscule tunicatis, subhyalinis vel pallidissime fibroso-brunneolis 2—3 μ diam. metientibus composito; strato tegente convexulo, contextu subcarbonaceo, fere opace atro-brunneo, e cellulis irregulariter angulosis, vix vel parum protractis, plerumque marginem versus distincte visibilibus, 3—5 μ me-

tientibus composito, primum clauso, postea rima rectiuscula, arte limitata aperta, e margine in hyphas plus minusve numerosas, undulatas transeunte; asci subnumerosi, parallele positae, crasse clavati, oblongo-ovoidei vel ellipsoidei, postice leniter attenuati vel subito contracti, subsessiles, crasse tunicati, 8-spori, 20—32 ⇌ 10—16 μ; sporae di- vel indistincte tristichae, oblongae, utrinque rotundatae, postice interdum leniter attenuatae tunc plus minusve clavatae, rectae, raro inaequilaterae vel curvulae, medio septatae, vix vel lenissime constrictae, diu hyalinae, plasmate minutissime granuloso repletae, denique pallide olivaceae, 10—13.5 ⇌ 4—6 μ; paraphysoides subnumerosae, fibrosae, supra ascos epithecium tenue subhyalinum indistincte et minute cellulosum formantia.

Auf lebenden Blättern von *Linociera ramiflora.* Philippinen; Luzon, Prov. Rizal, Antipolo, VIII. 1921, leg. M. Ramos.

Von diesem Pilze konnte ich ein zahlreiches Material untersuchen, das in meiner Mycotheca generalis unter Nr. 253 ausgegeben wurde. Dasselbe war zwar gut entwickelt, aber noch etwas jung, die Aszi der meisten Fruchtkörper enthielten nur hyaline Sporen.

Phyllachora kwantungensis Petr. n. spec.

Stromata sine maculis late et irregulariter dispersa, solitaria vel saepe bina complurave aggregata, tunc plus minusve connata et confluentia, plerumque amphigena 0.6—1.5 mm, raro usque ad 2 mm longa, 300—800 μ lata, confluendo tantum etiam majora, subnitida, atra, parum prominula; perithecia monosticha, raro incomplete disticha, plerumque dense stipata, depresso-globosa vel late ellipsoidea, saepe irregularia, 200—400 μ longa, 120—180 μ alta, superne clypeo plerumque ca. 30—60 μ crasso, opace atro-brunneo, contextu pseudoparenchymatico, e cellulis rotundato-angulosis, ca. 3—6 μ diam. metientibus composito tecta, ostiolo plano, clypeo omnino immerso, poro irregulariter rotundato vel elliptico, usque 30 μ lato perforato praedita; asci numerosi, nunc cylindracei, antice late rotundati, postice in stipitem brevem attenuati, 75—85 μ longi, 10—13 μ lati, nunc plus minusve clavati, 65—75 ⇌ 16—18 μ; sporae mono- vel plus minusve distichae, globosae vel late ellipsoideae, continuae, hyalinae, plasmate granuloso repletae, 10—12 ⇌ 9—10 μ vel ca. 10 μ diam.; metaphyses sat numerosae fibrosae, tenuissime tunicatae, 1.5—2 μ late, mox viescentes et mucosae.

Auf lebenden und absterbenden Blättern von *Panicum repens.* China; Kwangtung, Canton College, 14. VII. 1919, leg. O. A. Reinking, Nr. 6882.

Von den wenigen, auf Gramineen wachsenden *Phyllachora*-Arten mit mehr oder weniger kugeligen Sporen dürfte die hier beschriebene Form nur mit *Ph. sphaerosperma* Wint. näher verwandt,

davon aber vor allem durch die stets mehr oder weniger kugeligen, nicht unter 9 μ breiten Sporen hinreichend verschieden sein. Das Klypeusstroma dringt zwischen den Perithezien tief in das Mesophyll ein, ist entweder pseudoparenchymatisch oder besteht nur aus einem mehr oder weniger dichten Hyphengeflecht.

Phyllachora orbicula Rehm. — Auf lebenden Blättern von *Bambusa multiplex*. China; Prov. Kwangtung: Canton, 1920, leg. C. W. Howard Nr. 11578. — Sporen 12—18 ⇌ 5—6.5 μ.

Rhipidocarpon javanicum (Pat.) Theiss. et Syd. — Auf lebenden Wedeln und Wedelstielen von *Nipa fruticans*. Siam; Ban Mai Nakorn Chaisri, 7. VI. 1920, leg. O. A. Reinking, Nr. 9364.

Schiffnerula Clemensiae Petr. n. spec.

Plagulae semper hypophyllae, laxe dispersae, plerumque nervis crassioribus bene limitatae, sine maculis, sed in epiphyllo saepe decolorationes rufescentes efficientes, ca. 1—4 mm diam., raro etiam paulo majores; mycelium ex hyphis laxe reticulato-ramosis, in folii indumento saepe omnino occultatis, fere repentibus, tenuiter tunicatis, subhyalinis, pallide griseo-brunneolis vel olivascentibus, saepe iam omnino vietis, subremote septatis compositum, hyphopodia pauca, depresso-globosa vel pulvinata, continua, 7—11 μ diam.; perithecia dense dispersa vel gregaria, globosa vel ovoidea, inferne subito contracta, interdum quasi in stipitem usque ad 20 μ altum, superne ca. 50 μ crassum, deorsum plus minusve attenuatum transeuntia, omnino clausa, 90—150 μ diam.; pariete tenuiter membranaceo, gelatinoso-carnoso, primum distincte pseudoparenchymatico, ca. 8 μ crasso, e cellulis rotundato-angulosis, ca. 5—8 μ diam. metientibus, pro ratione crassiuscule tunicatis, superne pallide luteo-brunnneolis, inferne plus minusve obscurius coloratis composito; asci pauci, vix plus quam 5 in quoque perithecio, late ovoidei vel ellipsoidei, interdum subglobosi, antice late rotundati, postice subito contracti, sessiles vel brevissime stipitati, crasse tunicati, 8-spori, 45—55 ⇌ 30—40 μ; sporae conglobatae vel indistincte tristichae, oblongo-ovoideae vel ellipsoideae, utrinque late rotundatae, vix vel postice tantum lenissime attenuatae, rectae, raro inaequilaterae vel lenissime curvulae, circa medium septatae, plus minusve constrictae, episporio 1—1.5 μ crasso, plasmate granuloso repletae, diu hyalinae, denique pallide olivaceae, 22—26 ⇌ 12—15 μ; paraphysoides paucae, mox omnino mucosae.

Auf lebenden Blättern von *Trema orientalis*. Philippinen: Mt. Apo via Sibulan, Prov. Davao, Mindanao, VI. 1924, leg. M. S. Clemens, Nr. 5301.

Die Konidienform der *Sch. Clemensiae* ist das bisher nur aus Afrika bekannt gewordene *Capnodiastrum styloporum* (Cke.) Petr. in Sydowia VI. p. 342 (1952). Sie unterscheidet sich von der zu *Sch. tremae* Syd. gehörigen Nebenfruchtform *C. tremae* (Syd). Petr. durch die Art ihres Wachstums, grössere Pykniden, deutlicher erkennbare, etwas dunkler gefärbte Zellen der Pyknidenmembran, besonders aber durch heller gefärbte, am oberen Ende mit einer kegel- oder papillenförmigen, fast hyalinen Membranverdickung versehene, wesentlich grössere Konidien.

Von *Sch. tremae* Syd. unterscheidet sich die hier beschriebene Art schon habituell durch die niemals auf den Nerven, sondern stets auf der Blattfläche zur Entwicklung gelangenden Myzelrasen. Die Perithezien sind wesentlich grösser, ihre Membran ist ganz anders gefärbt und besteht aus grösseren Zellen. In bezug auf Form und Grösse der Sporen weicht der vorliegende Pilz von dem amerikanischen nicht wesentlich ab, doch scheinen hier die Sporen viel heller gefärbt zu sein. Sicher lässt sich das nicht sagen, weil mir der Pilz nur in jüngerem Entwicklungszustand vorliegt.

Auf den Myzelrasen der *Schiffnerula* parasitiert oft ein Hyphomyzet mit locker verzweigten, 3—4.5 µ dicken, durchscheinend graubraunen Myzelhyphen und einfachen, fast opak schwarzbraunen, bis ca. 200 µ langen, an der Spitze oft etwas heller gefärbten, unten 5—7 µ dicken Trägern, auf denen länglich spindelige, oder etwas keulige, gerade oder schwach gekrümmte, mit 4, seltener nur mit 3 Querwänden versehene, schwarzbraune, leicht verschrumpfende, 30—50 ⇌ 12—15 µ grosse Konidien gebildet werden. Das Myzel dieses Parasiten muss mit Vorsicht von dem der *Schiffnerula* unterschieden werden.

Botryodiplodia palmarum (Cke.) Petr. et Syd. — Auf abgestorbenen Fruchtstielen von *Areca catechu,* Siam: Chieng Mai, 21. VI. 1920, leg. O. A. Reinking, Nr. 9354. Pykniden in mehr oder weniger weitläufigen, ziemlich dichten Herden wachsend, klein, mit dem stumpf konischen Ostiolum punktförmig hervorbrechend. — Auf Wedelstielen von *Cocos nucifera.* Siam: Ban Mai Nakorn Chaisri, 7. VII. 1920, leg. O. A. Reinking, Nr. 9377. — Auf *Livistona chinensis.* China; Prov. Kwangtung, Canton College, 13. V. 1919, leg. O. A. Reinking, Nr. 5704. Pykniden in parallelen, sehr dichten Längsreihen hintereinander stehend, oft mehr oder weniger verwachsen.

Colletotrichum gloeosporioides Penz. — Auf lebenden Blättern von *Citrus* spec. Siam: Ban Mai Nakorn Chaisri, 6. VI. 1920, leg. O. A. Reinking, Nr. 11132.

Colletotrichum piperis Petch. — Auf *Piper* spec. Indochina: Kep, Cambadea, 28. V. 1920, leg. O. A. Reinking. Blattflekken von der Spitze des Blattes ausgehend, sich allmählich weiter ausbreitend und grosse Teile des Blattes zum Absterben bringend, graubraun, senkrecht zur Längsrichtung oft undeutlich gezont.

Coniothyrium occultum Syd. — Im Stroma einer *Phyllachora* auf lebenden Blättern von *Arundinella* spec. China; Prov. Kwangtung: Teu-Oo, 12. VI. 1919, leg. O. A. Reinking, Nr. 6768. Ist von der zuerst in Afrika, später auch in Niederösterreich gefundenen Art gewiss nicht verschieden.

Coniothyrium paulense P. Henn. — Auf abgestorbenen, sehr dünnen Ästchen von *Citrus sinensis*. China; Prov. Kwangtung, Henung Shan, 27. V. 1919, leg. O. A. Reinking, Nr. 4754. Stimmt genau zur Beschreibung dieser Art und ist sicher identisch.

Phyllostictina artocarpina (Syd. et Butl.) Syd. — Auf lebenden Blättern von *Artocarpus integrifolia*. Siam: Ban Mai Nakorn Chaisri, 6. VI. 1920, leg. O. A. Reinking. Flecken meist von der Spitze oder vom Rande ausgehend, zuerst klein, sich später oft ausbreitend und grosse Teile des Blattes zum Absterben bringend, sonst ganz mit der Originalkollektion übereinstimmend.

Phyllostictina citricarpa (McAlp.) Petr. in Sydowia VII. p. 115 (1953). — Auf abgestorbenen Blättern von *Citrus* spec. Siam: Bangkok, 9. VI. 1920, leg. O. A. Reinking, Nr. 11110. Stimmt mit Shear's Kollektion gut überein. Konidien 8—10.5 ⇌ 5—7 µ. *Phoma Puttemansii* Benatar in Rodriguesia II. p. 311 (1937) auf Früchten von *Citrus sinensis* aus Brasilien beschrieben, verursacht bis 8 cm grosse, schwärzliche Flecken und eine Fäulnis des Fruchtfleisches. Ist nach Beschreibung und Abbildung eine *Phyllostictina*, die von McAlpine's Art gewiss nicht verschieden ist. *Phoma eustaga* Penz. et Sacc. soll 10—13 ⇌ 6—8 µ grosse Konidien haben und gehört wahrscheinlich auch zu *Phyllostictina*. Die Konidien sollen aber einen grossen, glänzenden, zentralen Öltropfen enthalten, weshalb dieser Pilz vorläufig als von *Ph. citricarpa* verschieden erachtet werden muss.

Phyllostictina musarum (Kke.) Petr. — Auf absterbenden Blättern von *Musa sapientum*. Indochina: ohne nähere Angaben, leg. O. A. Reinking, Nr. 11497.

Cercospora personata (B. et C.) Ell. — Auf lebenden Blättern von *Arachis hypogaea*. China, ohne nähere Angaben, wahr-

scheinlich aus der Umgebung von Canton, leg. O. A. Reinking, Nr. 4624.

Cercospora punicae P. Henn. — Auf lebenden Blättern von *Melia azedarach*. China: Prov. Kwantung, Canton College, 10. V. leg. O. A. Reinking, Nr. 6785. Blattflecken dicht zerstreut, rundlich oder elliptisch, schwärzlich, meist scharf begrenzt.

Cercospora subsessilis Syd. — Auf lebenden Blättern von *Melia azedarach*. China: Prov. Kwangtung, Canton College, 10. V. 1919, leg. O. A. Reinking, Nr. 6783.

Phaeoisariopsis griseola (Sacc.) Ferr. — Auf lebenden Blättern von *Phaseolus* spec. Indochina, ohne nähere Angaben, leg. O. A. Reinking, Nr. 11508.

Sclerozythia n. gen., eine neue Gattung der nectrioideen Sphaeropsideen.

Von F. Petrak (Wien).

Sclerozythia Petr. n. gen.

Pycnidia dispersa, superficialia, in subiculo tenuiter membranaceo, hyalino vel subhyalino, fibroso evoluta, globosa vel late ellipsoidea, omnino clausa nec ostiolata, in maturitate probabiliter irregulariter dilabentia; pariete tenuiter membranaceo-carnoso, contextu pseudoparenchymatico, pallide flavido; conidia numerosissima, quoad formam variabilia, late ellipsoidea vel ovoidea, raro clavato-oblonga vel fere cylindracea, saepe angulosa et irregularia, non raro plus minusve globosa, hyalina, continua, maxima tantum rarissime septata, plasmate granuloso farcta, probabiliter ex hyphis densissime ramosis et contextis, brevissime articulatis, loculum pycnidii omnino explentibus, in maturitate in articulos singulos dilabentibus oriunda.

Pykniden zerstreut, sich oberflächlich auf einem dünnen, zarthäutigen, hyalinen oder subhyalinen, feinfaserigen Subikulum entwickelnd, bisweilen aber auch subepidermal eingewachsen, rundlich oder breit ellipsoidisch, völlig geschlossen, keine Spur einer vorgebildeten Öffnung zeigend, bei der Reife wahrscheinlich am Scheitel unregelmässig aufreissend oder zerfallend. Pyknidenmembran von häutiger, ziemlich weichfleischiger Beschaffenheit, von pseudoparenchymatischem, sehr hell gelblichem Gewebe; Konidien massenhaft, von sehr verschiedener Form, breit ellipsoidisch oder eiförmig, selten länglich keulig oder fast zylindrisch, oft rundlich oder stumpfeckig, hyalin einzellig, nur die grössten zuweilen mit einer undeutlichen, ungefähr in der Mitte befindlichen Querwand, mit ziemlich grobkörnigem Plasma, 6.5 ⇌ 4 μ oder ca. 4 μ im Durchmesser, wahrscheinlich durch Zerfall eines den ganzen Konidienraum vollständig ausfüllenden sehr dichten und sehr kurzgliedrigen Plektenchymus entstehend.

Sclerozythia nectrioidea Petr. n. spec.

Pycnidia irregulariter et laxa dispersa, plerumque solitaria vel pauca subaggregata, raro subepidermalia, plerumque omnino superficialia, in subiculo tenuiter membranaceo, ca. 12—20 μ, ad basin pycnidii usque ad 30 μ crasso, hyalino vel subhyalino, minutissime fibroso-plectenchymatico evoluta, globosa vel late ellipsoidea, vix vel parum depressa, raro irregularia, 140—200 μ diam. omnino clausa

nec ostiolata, plus minusve collabascentia, carnea vel pallide cinnabarina; pariete carneo-membranaceo, 12—18 μ, in vertice ca. 10—13 μ crasso, contextu pseudoparenchymatico, e cellulis irregulariter angulosis, pro ratione crassiuscule tunicatis, plus minusve compressis. pallide flavidis, 4—12 μ diam. metientibus, raro plus minusve protractis, tunc usque ad 16 μ longis composito; conidia numerosissima, quoad formam variabilia, late ellipsoidea vel ovoidea, raro oblongo-clavata vel fere cylindracea, utrinque late, saepe plus minusve truncato-rotundata, recta vel inaequilatera, saepe obtuse angulosa et plus minusve irregularia, non raro subglobosa, hyalina, continua, maxima interdum circa medium indistincte septata, plasmate granuloso farcta, 3.5—10 ⇌ 3—5 μ vel ca. 3.5—6 μ diam., probabiliter ex hyphis densissime ramosis et contextis, loculum pycnidii primo omnino replentibus, brevissime articulatis, postea in articulos singulos dilabentibus oriunda.

Pykniden sehr unregelmässig und locker zerstreut, meist ganz vereinzelt, selten zu mehreren kleine, ganz unregelmässige Gruppen bildend, sich ganz oberflächlich auf einem ca. 14—20 μ dicken, sich rings um den Rand des Gehäuses bis auf ca. 30 μ verdickenden, zarthäutigen, hyalinen oder subhyalinen, aus reich verzweigten, sehr dicht verflochtenen, zartwandigen, schon mehr oder weniger stark verschrumpften, ca. 1.5 μ dicken Hyphen bestehenden Subikulum, bisweilen aber auch in oder unter der Epidermis entwickelnd, rundlich oder breit ellipsoidisch, kaum oder schwach niedergedrückt, seltener auch ziemlich unregelmässig, 140—180 μ, seltener bis ca. 200 μ im Durchmesser, völlig geschlossen, keine Spur einer vorgebildeten Öffnung zeigend, bei der Reife wahrscheinlich ganz unregelmässig zerfallend, in trockenem Zustande ziemlich stark, oft konkav eingesunken, fleischrötlich oder sehr hell zinnoberrötlich. Pyknidenmembran von weichhäutig-fleischiger Beschaffenheit, unten und an den Seiten ca. 12—18 μ, am Scheitel 10—13 μ dick, aus mehreren, meist 3—4 Lagen von rundlich eckigen, ca. 4—12 μ grossen, selten etwas gestreckten, dann bis ca. 16 μ langen, relativ dickwandigen, sehr hell gelblichen, mehr oder weniger zusammengedrückten Zellen bestehend. Konidien massenhaft, schleimig verklebt zusammenhängend, von sehr verschiedener Form, meist breit ellipsoidisch oder eiförmig, seltener länglich keulig oder fast zylindrisch, beidendig breit, oft mehr oder weniger gestutzt abgerundet, gerade oder ungleichseitig, oft stumpfeckig, dann mehr oder weniger unregelmässig, nicht selten fast kugelig, einzellig, nur die längsten zuweilen in der Mitte mit einer undeutlichen Querwand, hyalin, mit ziemlich grobkörnigem Plasma, 3.5—7 μ, selten bis ca. 10 μ lang, 3.5 μ breit oder 3.5—5 μ, selten bis 6 μ im Durchmesser, wahrscheinlich durch Zerfall eines den ganzen Konidienraum ausfüllenden, sehr dichten Plektenchyms

von reich verzweigten und verflochtenen, sehr kurzgliederigen Hyphen entstehend.

Auf dürren Blattstielen von *Astragalus* spec.; Iran; Prov. Fars: Schiraz → Tolé Khossrow, 23. VII. 1949, leg. Behboudi. — Auf dürren Stengeln von *Helichrysum* spec.; Iran: Abé-Ali-Gebirge, 14. VI. 1947, leg. E. Esfandiari.

Der Pilz ist auf beiden Kollektionen nur sehr spärlich vorhanden. Er wächst auf *Astragalus* in Gesellschaft von *Omphalospora melaena* (Fr.) v. H. und einer Form von *Pleospora chlamydospora* Sacc. Dieselbe *Pleospora* und eine *Hendersonia*-Art sind auch auf der *Helichrysum*-Kollektion vorhanden. Diese ist noch ganz unreif und zeigt auf Querschnitten nur ein hyalines, den ganzen Konidienraum ausfüllendes, scheinbar pseudoparenchymatisches, aus rundlich eckigen, ca. 3.5—7 μ grossen Zellen bestehendes Gewebe. Die *Astragalus*-Kollektion zeigt auf Querschnitten dasselbe Bild. Hier lassen sich aber durch vorsichtigen, schwachen, etwas reibenden Druck die den Pyknidenraum ausfüllenden Zellen sehr leicht voneinander trennen. Wird ein ganzes Gehäuse vorsichtig zerdrückt, so sieht man mehr oder weniger zahlreiche, oft undeutlich verzweigte Konidienketten, was mit grosser Wahrscheinlichkeit darauf schliessen lässt, dass die Konidien auf die oben angegebene Weise entstehen. Von Konidienträgern ist keine Spur vorhanden.

Fungi beltsvillenses.

VI.

Von F. Petrak (Wien).

41. *Gnomonia Ospinae* Chardon.

Dieser Pilz wurde auf lebenden Blättern von *Tecoma spectabilis* gefunden und in Bol. Real Soc. Espan. Hist. Nat. XXIVIII. p. 120 (1928) beschrieben. Nach einem mir vorliegenden Originalexemplar ist *G. Ospinae* eine typische *Apiosphaeria,* die der *A. guaranitica* (Speg.) v. Höhn. nahesteht. Sie unterscheidet sich aber davon durch das stark reduzierte, oft auch fast ganz fehlende Stroma, durch die etwas breiteren Sporen und durch die deutlich vorragenden Mündungen. Die Sporen sind ungefähr im unteren Drittel septiert, an der Querwand nicht oder nur sehr schwach eingeschnürt, subhyalin, in Mengen sehr hell gelblich gefärbt und bestehen aus einer fast kugeligen oder sehr breit eiförmigen, ca. 9—10 μ breiten, homogenes, stark lichtbrechendes Plasma enthaltenden Oberzelle und einer ziemlich spitz konischen, dünnwandigeren, an der Querwand ca. 5—6 μ breiten Unterzelle. Dieser Pilz wird daher als *Apiosphaeria Ospinae* (Chard.) Petr. comb. nov. einzureihen sein.

42. **Phyllachora monanthochloes** Petr. n. spec.

Stromata hypophylla, raro epiphylla, irregulariter laxe vel subdense dispersa, plus minusve protracta, quoad formam et magnitudinem variabilia; maculas nigrescentes, breviter striiformes vel anguste ellipticas, indistincte limitatas efficientia, 0.5—2 mm longa, 200—700 μ lata, interdum etiam angustissime striiformia, tunc 100—150 μ tantum lata; perithecia longitudinaliter 2-pluriseriata, in mesophyllo evoluta, obtuse angulosa et sinuosa, tunc plerumque omnino irregularia, raro depresso-globosa vel ellipsoidea, ostiolo atypico, clypeo plus minusve rudimentari, epidermali, usque ad 20 μ crasso innato punctiformiter erumpentia, 150—320 μ diam.; pariete tenuiter membranaceo, 6—12 μ, raro usque ad 15 μ crasso, contextu pseudoparenchymatico, e cellulis irregulariter angulosis, 4—7 μ diam. metientibus vel plus minusve elongatis, tunc usque ad 10 μ longis, obscure brunneis, ad basin interdum pallide brunneis vel subhyalinis, valde compressis, extus hyphis subhyalinis vel brunneolis, tenuissime tunicatis, ca. 1.5—2 μ crassis obsito; asci numerosi, clavati vel cylindraceo-clavati, antice late rotundati vel subtruncati, postice

plus minusve attenuati, breviter stipitati, tenuiter tunicati, 8-spori, p. sp. 65—85 ⇌ 15—20 μ; sporae di- raro fere monostichae, breviter cylindraceae vel anguste ellipsoideae, raro oblongo-ovoideae, utrinque late rotundatae, non vel vix attenuatae rectae, raro inaequilaterae, continuae, hyalinae, 15—20 ⇌ 7—9.5 μ; metaphyses numerosae, late fibrosae, tenuiter tunicatae, mox viescentes et mucosae.

Auf lebenden und absterbenden Blättern von *Monanthochloe litoralis*. Golf von Californien: Insel Raza, 21. IV. 1921, leg. J. M. Johnston.

Auf der Blattunterseite sieht man zahlreiche, ganz gerade, sehr schmale Längsrillen, in welchen sich die Spaltöffnungen befinden. Zwischen je zwei benachbarten Rillen wird die derbwandige Epidermis durch ein mit ihr sehr fest verwachsenes, meist aus 2—5 Schichten von rundlich eckigen, 4—7 μ, selten bis ca. 10 μ grossen Zellen bestehendes Parenchym verstärkt. Das Stroma des Pilzes ist im Mesophyll auf ein lockeres Geflecht von 1.5—2 μ dicken, zarten, subhyalinen oder sehr hell gelbbräunlichen Hyphen beschränkt. Der stark reduzierte Klypeus umgibt nur das oft sehr exzentrische, stets unter den Rillen zur Entwicklung gelangende und am Grunde derselben nach aussen mündende Ostiolum. Das Mesophyll wird von mehreren im Querschnitt ca. 60—80 μ dicken Gefässbündeln durchzogen, durch welche die oft zwischen oder über ihnen zur Entwicklung gelangenden Perithezien oft mehr oder weniger stark eingedrückt und stark deformiert werden. Die Fruchtschicht ist leider noch sehr jung und mehr oder weniger verschumpft. Es wurden nur wenige, etwas besser entwickelte Sporen enthaltende Aszi gefunden, weshalb die darauf bezüglichen Angaben in der oben mitgeteilten Beschreibung vielleicht noch zu ergänzen und zu berichtigen sein werden.

43. *Phyllachora portoricensis* (Chard.) Orton.

Sphaerodothis portoricensis Chard. in Journ. Dept. Agric. Puerto Rico, XVI. p. 189 (1932) wurde von Orton in Mycologia XXXVI. p. 44 (1944) *Phyllachora portoricensis* (Chard.) Orton genannt. Der genannte Autor hat aber übersehen, dass *Trabutia portoricensis* Stev. in Bot. Gaz. LXX. 401 (1920) schon früher, nämlich in Annal. Mycol. XXIX. p. 385 (1931) als *Phyllachora portoricensis* (Stev.) Petr. eingereiht wurde. *Sphaerodothis portoricensis* Chard. wird deshalb *Phyllachora arthhrostylidii* Petr. et Cif. in Annal. Mycol. XXX. p. 232 (1932) zu heissen haben. Mir sind noch zwei spezifisch verschiedene, ursprünglich bei anderen Gattungen mit der Bezeichnung „*portoricensis*" eingereihte *Phyllachora*-Arten bekannt, die hier zur Vermeidung ähnlicher Irrtümer erwähnt werden sollen.

1. *Phyllachora Halstediana* Petr. l. c. XXXII. p. 320 (1934).

Syn.: *Halstedia portoricensis* Stev. in Bot. Gaz. LXIX. p. 253 (1920).

2. *Phyllachora hoyosensis* Petr. n. nom.

Syn.: *Catacauma portoricensis* Chardon in Mycologia XIX. p. 297 (1927).

Auf einer nicht näher bestimmten Nährpflanze hat A. M. Brenes in Costa Rica bei San Ramon Ende Jänner eine *Phyllachora* gesammelt, von der mir zahlreiches Material vorliegt. Ich glaube, dass dieser Pilz auf einer *Ficus*-Art wächst und mit *Ph. hoyosensis* identisch sein muss, da er mit einem von Chardon als *Catacauma portoricensis* bestimmten, mir vorliegenden Exemplare aus San Salvador völlig übereinstimmt. Auch die Nährpflanze, die auf der Kollektion aus San Salvador als *„Ficus sp."* bezeichnet wird, scheint davon nicht verschieden zu sein. Auf dem von Brenes gesammelten Material ist auch die *Linochora* reichlich vorhanden.

44. **Xylosphaeria floridana** Petr. n. spec.

Perithecia irregulariter et laxe dispersa, in tuberculo majusculo ligneo ellipsoideo, postea supra ligni superficiem elevato, griseonigrescente, ca. 1.5—2 mm longo, 0.5—1 mm lato solitaria, raro 2—3 dense aggregata, ambitu globosa sed plus minusve angulosa, tunc saepe valde irregularia, 200—300 μ diam., profunde immersa, ostiolo cylindraceo-conico, ca. 70 μ crasso, in apice tuberculi punctiformiter erumpente sed non prominulo, poro rotundato ca. 20 μ lato perforato praedita; pariete membranaceo, ca. 30—40 μ crasso, contextu sat indistincte pseudoparenchymatico e cellulis irregulariter rotundato-angulosis, tenuiter tunicatis, 4—5 μ raro usque ad 7 μ diam. metientibus, pellucide olivaceis, intus pallidioribus, vix compressis composito; asci cylindracei, antice late rotundati, postice in stipitem brevem crassiusculum attenuati, crasse tunicati, 8-, raro 4—6-spori, p. sp. 65—80 ⇌ 9—12 μ; sporae oblique monostichae, ellipsoideae vel ovoideae, utrinque late rotundatae, vix postice tantum parum attenuatae, rectae vel inaequilaterae, minores tantum 1-majores 2—3-septatae et saepe septo incompleto, longitudinali praeditae, non vel circa medium tantum lenissime constrictae, olivaceae, 9—14 μ, raro usque ad 16 μ longae, 5—9.5 μ latae; paraphyses numerosae, fibrosae, simplices, raro ramosae, ca. 1.5 μ crassae, ascos superantes, sero mucosae.

Auf entrindetem Holze von *Quercus* spec., Brooksville, Florida, USA., 1. IV. 1938, leg. C. L. Shear.

X. floridana ist eine typische, durch die kleinen, oft nur mit einer Querwand versehenen Sporen sehr ausgezeichnete und leicht

kenntliche Art, deren tief eingesenkte Perithezien mit dem konisch zylindrischen Ostiolum punktförmig hervorbrechen. Von der nahe verwandten *X. livida* (Pers.) Petr. unterscheidet sich der hier beschriebene Pilz durch das stark reduzierte, nur durch eine schwarzbraune Verfärbung der deckenden Substratschichten angedeutete Stroma und durch die kleineren Sporen. Nach B e r l e s e, Icon. Fung. II. p. 71, Tab. CIII. Fig. 1 hat *X. livida* ein eingewachsenes, knollenförmiges Stroma, dem die Perithezien fast lokuliartig eingebettet sind.

45. **Hendersonia Jonesiana** Petr. n. spec.

Maculae irregulariter et laxe dispersae, saepe e folii margine oriundae, utrinque visibiles, plerumque solitariae, raro 2—3 aggregatae, tunc plus minusve confluentes, ambitu orbiculares vel ellipticae, ca. 1—2 mm latae, interdum plus minusve elongatae, tunc usque ad 3 mm longae, 600—1000 μ latae, confluendo etiam paulo majores, saepe angulosae et plus minusve irregulares, pallide flavidae; pycnidia amphigena, irregulariter laxe vel dense dispersa, interdum 2—4 aggregata et plus minusve connata, subepidermalia, depresso-globosa vel ellipsoidea, 80—150 μ, raro usque ad 200 μ lata, primo, ut videtur, omnino clausa, vel epidermide tantum tecta, in maturitate late, plerumque usque ad verticis marginem aperta, extus hyphis laxe ramosis, tenerrimis, subhyalinis, indistincte septatis praedita; pariete in parte inferiore tantum distincte evoluto tenuiter membranaceo, ca. 10—15 μ crasso, contextu pseudoparenchymatico, e cellulis rotundato-angulosis, pro ratione crassiuscule tunicatis, ca. 4—10 μ diam. metientibus, luteo- vel pallide ferrugineo-brunneis, vix compressis composito, extus cum reliquiis matricis omnino vietis, arte connato, idcirco indistincte limitato; conidia numerosissima, mucoso-conglutinata, anguste cylindracea, utrinque vix vel parum attenuata, antice obtusa, postice plus minusve truncata, recta vel curvula 1- vel 2—3-pseudoseptata non constricta, singulatim subhyalina, in cumulo mellea vel pallide olivacea, plasmate laxe granuloso repleta, episporio fere 0.5 μ crasso, 18—30 μ, raro usque ad 40 μ longa, 4.5—5 μ lata; conidiophora breviter conoideo-cylindracea, vix 5 μ longa, 2—3 μ lata.

Auf lebenden Blättern von *Prunus Andersonii*. USA. Nevada: Reno, foothills, ca. 5500 ft., 12. VI. 1897, leg. M. E. J o n e s.

Ich konnte diesen Pilz in der mir zur Verfügung stehenden Literatur nicht finden, weshalb ich ihn als neu beschreiben musste. Auf dem vorliegenden Material habe ich nur überreife Fruchtkörper gefunden, die bis zum Rande geöffnet waren. Ob ursprünglich völlig geschlossene, ostiolierte oder melanconioide, oben nur von der Epidermis bedeckte Fruchtkörper vorhanden sind, konnte nicht sicher festgestellt werden. Von den typischen *Hendersonia*-Arten weicht dieser Pilz wesentlich ab.

46. **Hypocenia caespitosa** Petr. n. spec.

Pycnostromata in ligni superficie griseo-nigrescente caespites minutos, parallelos, anguste striiformes, 1—4 mm, raro usque ad 10 mm longos formantia, in seriebus 1—3 longitudinalibus densissime stipata, e fissuris ligni angustis emergentia, verticaliter saepe manifeste elongata, ellipsoidea vel ovoidea, raro fere globosa, nunc vertice plus minusve convexo tantum, nunc plus minusve prominula, inferne inter se saepe connata, 400— 500 μ diam., raro paulo majora, 300—450 μ alta, primo omnino clausa, in vertice obtuse conico vel deplanato nonnullis rimis radiantibus praedita, ibique in maturitate probabiliter disrumpentia; pariete superne ca. 30—50 μ, raro usque ad 70 μ crasso, in humido intumescente, gelatinoso-cartilagineo, contextu pluristratoso, e cellulis rotundato-angulosis, saepe parum elongatis, pro ratione crassiuscule tunicatis, superne obscure atro-brunneis, basin versus paulatim pallidioribus, pallide rufo- vel castaneo-brunneis 6—12 μ, raro usque ad 15 μ diam. metientibus composito; pariete basali usque ad 30 μ crasso, extus saepe cum reliquiis matricis omnino vietis imbuto vel connato, e cellulis minoribus, saepe compressis, hyalinis vel pallidissime rufo-brunneolis composito; conidia numerosissima, bacillari-cylindracea, utrinque plus minusve truncata nec attenuata, medio saepe distincte pseudoseptata, in quoque loculo guttulis 2—3 vel plasmate laxe granuloso tantum praedita, hyalina, catenulata, 7—12 μ, usque 17 μ longa, 2.5—3.5 μ lata.

Auf einem entrindeten Aste von *Viburnum* spec. in Wäldern gegen Laurel an der aufgelassenen elektrischen Bahn bei Beltsville, Maryland, USA, 2. VII. 1950 von mir gesammelt.

Wie bei der von Petrak und Sydow in Annal. Mycol. XXI. p. 381 (1923) ausführlich beschriebenen *Hypocenia obtusa* B. et C. entstehen auch bei der oben beschriebenen Art die Konidien aus langen, verzweigten Fruchthyphen. *H. obtusa* unterscheidet sich aber durch das in den Konidienraum weit hineinragende, zylindrische oder stumpf kegelförmige Basalstroma und durch ungefähr doppelt so lange, oft mit mehreren Inhaltsteilungen versehene Konidien. *H. caespitosa* wird deshalb als Typus einer neuen Untergattung aufzufassen sein, die auf folgende Weise zu charakterisieren wäre:

Hypocenia subgen. **Hypoceniella** Petr. n. subgen.

Pycnidia in caespitulis striaeformibus dense aggregata, in parte inferiore plerumque plus minusve connata, sine stromate basali, propterea loculo ovoideo vel ellipsoideo; conidia plerumque 1- rarissime 2-pseudoseptata vel continua.

Myiocoprula n. gen., eine neue Gattung der hemisphaerioiden Fungi imperfecti.

Von F. Petrak (Wien).

Myiocoprula Petr. n. gen.

Pycnidia dispersa vel gregaria, tunc plus minusve, saepe omnino connata vel in stromate superficiali tenuiter crustaceo evoluta, dimidiato-scutata, lenticularia, omnino clausa, in maturitate probabiliter irregulariter disrumpentia, strato basali tenuissime membranaceo, hyalino, strato tegente obscure atro-brunneo, in centro pseudoparenchymatico, marginem versus manifeste radioso, hypostromate in epidermide vel etiam in cellulis subepidermalibus evoluto, hyalino vel pallide brunneolo, pseudoparenchymatico vel indistincte hyphoideo, per stomata erumpente et in stroma superficiale transeunte; conidia acrogena breviter et tenuissime filiformia, raro recta, plerumque curvula, continua, hyalina; conidiophora totam strati tegentis superficiem obtegentia plus minusve lageniformia vel bacillari-conoidea.

Fruchtgehäuse zerstreut oder herdenweise, dann entweder direkt oder durch ein oberflächliches, dünn krustiges, pseudoparenchymatisches, an den dickeren Stellen oft deutlich prosenchymatisches Stroma miteinander verwachsen, mehr oder weniger ausgebreitete, mattschwarze Krusten bildend, im Umriss rundlich oder breit ellipsoidisch, oft etwas unregelmässig, halbiert-schildförmig, von linsenförmigem Querschnitt, völlig geschlossen, mit hyaliner, zarthäutiger Basalschicht und dunkel schwarzbrauner, pseudoparenchymatischer, am Rande deutlich radiär gebauter Deckschicht, durch zahlreiche, hell gelbbräunliche oder subhyaline, senkrecht faserige, hypostromatische Fortsätze den Spaltöffnungen eingewachsen und in das intramatrikale, sich in der Epidermis, oft auch in den subepidermalen Zellschichten entwickelnde, hyaline oder nur sehr hell gelbbräunliche Hypostroma übergehend. Konidien kurz- aber sehr dünnfädig, meist mehr oder weniger gekrümmt, einzellig, hyalin, akrogen auf dünn flaschenförmigen oder konisch stäbchenförmigen, einfachen, die ganze Innenfläche der Deckschicht überziehenden Trägern entstehend.

Myiocoprula gregaria Petr. n. spec.

Pycnidia dimidiato-scutata, lenticularia, ca. 100—170 μ diam., omnino clausa, in maturitate probabiliter irregulariter disrumpentia, nunc laxe dispersa, plerumque solitaria, nunc dense gregaria, tunc

plus minusve, saepe omnino connata vel in stromate superficiali tenuiter crustaceo, contextu pseudoparenchymatico vel interdum manifeste prosenchymatico evoluta; strato tegente obscure atro-brunneo, in centro pseudoparenchymatico, marginem versus manifeste radioso, strato basali tenuissime membranaceo, hyalino; hypostromate in epidermide et in cellulis subepidermalibus evoluto, hyalino vel pallide flavo-brunneolo, per stomata erumpente et in stroma superficiale transeunte; conidia numerosissima, breviter sed tenuissime filiformia, plerumque plus minusve et varie curvula, continua hyalina, 6—13 ⇌ 1 μ; conidiophora totam strati tegentis superficiem interiorem obtegentia, breviter et anguste lageniformia vel conica, simplicia, sero mucosa.

Fruchtkörper oberflächlich, zerstreut, einzeln oder zu mehreren gehäuft und mehr oder weniger verwachsen, bisweilen aber auch grössere oder kleinere, dichte Herden bildend, direkt oder durch dünn krustiges Stroma miteinander verwachsen und grössere oder kleinere, matt schwarze, dünne, durch die Gehäuse sehr flach warzige, ganz unregelmässige, in der Längsrichtung des Substrates aber meist etwas gestreckte, zusammenhängende oder etwas unterbrochene Krusten bildend. Der Pilz hat ein sich in der Epidermis, oft auch in den subepidermalen Zellschichten entwickelndes Hypostroma, das die Zellen der Matrix teilweise, bisweilen auch ganz ausfüllt und pseudoparenchymatisch oder fast hyphig gebaut ist und aus rundlich eckigen, in der Epidermis meist sehr hell gelbbräunlichen, oft ziemlich stark gestreckten, bis 10 μ grossen, weiter innen hyalinen, rundlich eckigen, 3—6 μ grossen, relativ dickwandigen Zellen oder aus kleinen Knäueln von ca. 3—5 μ breiten Hyphen besteht. In und unter den Spaltöffnungen verdichtet sich das Gewebe, bildet kleine, im Umriss rundliche, elliptische oder stumpf konische, senkrecht faserig zellige, hell gelbbräunliche Hypostromata, die hervorbrechen und an der Oberfläche die Fruchtkörper entwickeln. Diese sind im Umriss rundlich oder breit elliptisch, oft etwas stumpfeckig und unregelmässig, ca. 100—170 μ gross, halbiert schildförmig, völlig geschlossen, bei der Reife wahrscheinlich unregelmässig zerfallend. Die Basalschicht besteht aus einem sehr zarten, hyalinen Häutchen, das keine besondere Struktur erkennen lässt. Die dunkel, in der Mitte oft opak schwarzbraune Deckschicht ist ca. 7—10 μ dick und besteht im mittleren Teil aus rundlich eckigen, ziemlich dünnwandigen, ca. 5—9 μ grossen, schwarzbraunen, am Rande mehr oder weniger stark gestreckten, bis ca. 13 μ langen, 4—5 μ breiten, in radiären Reihen angeordneten, sich allmählich heller färbenden, bei den isolierten Fruchtkörpern am Rande oft, sehr hell gelbbräunlich gefärbten Zellen. Die oberflächliche Stromakruste, welche die Fruchtkörper bei dichtem Wachstum verbindet, ist meist ca. 12—30 μ, selten bis ca. 40 μ dick und besteht

innen aus rundlich eckigen, relativ dickwandigen, subhyalinen oder hell graubräunlichen, an den dickeren Stellen in senkrechter Richtung oft etwas gestreckten, in mehr oder weniger deutlichen, senkrechten Reihen angeordneten, dann bis ca. 13 μ langen, 4—6 μ breiten Zellen und geht oben plötzlich in die ca. 6—8 μ dicke, fast opak schwarzbraune Deckschicht über. Konidien massenhaft, kurz fädig, beidendig stumpflich, selten gerade, meist bogig oder S-förmig, oft auch ganz unregelmässig gekrümmt, hyalin, einzellig, 6—10 μ, seltener bis 13 μ lang, ca. 1 μ dick. Konidienträger die ganze Innenfläche der Deckschicht des flach linsenförmigen Konidienraumes überziehend, dünn flaschenförmig oder etwas konisch, beidendig, oben stärker verjüngt, einzellig, 6—10 μ lang, in der Mitte 2.5—3.5 μ dick, spät verschleimend.

Massenhaft auf dürren Ranken von *Smilax* spec. in den Wäldern nordwestlich von der Plant Industry Station bei Beltsville, Maryland, USA., VI. 1950, leg. F. Petrak.

Dieser Pilz ist die Nebenfruchtform von *Myiocopron smilacis* (de Not.) Sacc. Er war am oben genannten Standort noch viel häufiger als die ebenfalls reichlich vorhandene Schlauchform anzutreffen und wird so wie diese auf dürren *Smilax*-Ranken weit verbreitet und gewiss auch sehr häufig sein. Dennoch scheint er bisher noch nicht beschrieben, jedenfalls noch nicht benannt worden zu sein, da ich ihn in der mir zur Verfügung stehenden Literatur nicht finden konnte. Auf *Smilax* werden zwei Leptostromaceen angeführt, nämlich *Leptostroma smilacis* Cke. in Hedwigia 1878, p. 37 und *Leptothyrium smilacis* Dearness in Mycologia, XVI, p. 165 (1924). Den zuerst genannten Pilz konnte ich auf Grund des Originalexemplares, das mir die Direktion der Roy. Bot. Gard. in Kew in dankenswerter Weise zur Verfügung gestellt hat, nachprüfen und mich davon überzeugen, dass die Aufstellung dieser Art auf einem grossen Irrtum beruht. Cooke's Original zeigt nämlich nur ganz unreife Fruchtkörper von *Myiocopron smilacis* (de Not.) Sacc. Die ca. $4 \rightleftharpoons 3$ μ grossen Zellen des hyalinen Binnengewebes der Fruchtgehäuse dieses Schlauchpilzes hat Cooke für Konidien gehalten! *Leptostroma smilacis* Cke. ist daher nur ein Synonym von *Myiocopron smilacis*.

Leptothyrium smilacis Dearnes soll nach der Beschreibung viel grössere, 2—3 mm lange, 1—3 mm breite Pykniden und längliche, beidendig spitze („acute ends"), $6—13 \rightleftharpoons 3$ μ grosse Konidien und bis 12 μ lange Träger haben. Nach der Beschreibung lässt sich dieser Pilz nicht sicher beurteilen. Zu *Leptothyrium* gehört er sicher nicht. Ich vermute, dass es sich hier um eine, kleine Stromaflecken verursachende *Phomopsis* handeln dürfte.

Beiträge zur Pilzflora von Zentral- und Südamerika.

Von F. Petrak (Wien).

Dimerina Schmidtiana Petr. n. spec.

Perithecia irregulariter et laxe dispersa, solitaria, hypophylla, pilis indumenti folii stellatis insidentia, globosa, vix vel parum depressa, omnino clausa, ostiolo atypico, plano, papilliformi, saepe indistincto, denique poro irregulariter rotundato ca. 12—15 μ lato perforato praedita, 70—130 μ diam., in mycelio densiusculo, fere tantum sub perithecii basi evoluto, ex hyphis dense reticulato-ramosis, curvulis, indistincte septatis, melleis vel pallide olivaceis, 3—4.5 μ crassis composito oriunda; pariete membranaceo, ca. 10 μ crasso, contextu pseudoparenchymatico, e cellulis irregulariter angulosis, vix compressis, pro ratione crassiuscule tunicatis, atro-brunneis, 5—10 μ, raro usque ad 12 μ diam. metientibus composito; asci subnumerosi vel pauci, cylindraceo-obclavati, postice subito contracti, antice late rotundati, subsessiles, crasse tunicati, 8-spori, 32—50 ⇌ 10—16 μ; sporae di- vel indistincte tristichae, oblongo-clavatae, utrinque obtusae, postice leniter, sed plerumque distincte, antice vix, interdum etiam magis attenuatae, tunc subfusoideae, rectae, raro inaequilaterae, medio septatae, non vel lenissime constrictae, hyalinae, 10—14 ⇌ 3—4 μ; paraphysoides paucae iam omnino mucosae.

Auf lebenden Blättern von *Styrax* spec., wahrscheinlich *St. argentea*; Costa Rica: Vara Blanca bei San José, II.—III. 1931, leg. H. Schmidt.

Die meisten Perithezien sind völlig kahl. Vereinzelt kommen auch Gehäuse vor, die oben mit 1—3 einfachen, geraden oder schwach bogig gekrümmten, schwarzbraunen, sich oben verjüngenden, ca. 30—70 μ langen, unten 3—4 μ breiten Borsten besetzt sind.

Lohwagia verruciformis Petr. n. spec.

Stromata amphigena, in epiphyllo saepe plus minusve rudimentaria, irregulariter et laxe dispersa, gallaeformia, ambitu orbicularia vel elliptica, interdum plus minusve irregularia; crasse pulvinata, superne convexula vel applanata, nigrescentia vel obscure grisea, irregulariter et minute ruguloso-sulcata vel glebuloso-verruculosa, in foliis 1—4 mm diam. vel ca. 1.5—6 mm longa, 1—4 mm lata, in ramulis plus minusve globosa, usque ad 9 mm diam., crustas in epiphyllo ca. 40—160 μ, raro usque 260 μ crassas, mesophyllum hyper-

trophice deformatum pallide flavidum usque ad 750 μ incrassatum includentia, contextu pseudoparenchymitico, subinde etiam prosenchymatico, e cellulis irregulariter angulosis nunc fere isodiametricis, ca. 6—18 μ diam. metientibus, nunc subelongatis, tunc usque ad 23 μ longis, 6—16 μ latis, tenuiter tunicatis, atro-brunneis composito, in mesophyllo subhyalino, reliquiis matricis vietis minoribus majoribusve interrupto; perithecia nunc 1- nunc di- vel indistincte tristicha, quoad formam variabilissima, plerumque plus minusve dense stipata, plus minusve depressa, tunc ca. 200—300 μ diam. vel a latere compressa, tunc quasi verticaliter protracta, anguste ellipsoidea vel ovoidea, usque ad 400 μ alta, 140—200 μ lata, ostiolo subelongato, stromati fere omnino immerso, subelongato-conico usque ad 130 μ alto, in apice ca. 60 μ crasso, antice truncato-rotundato, vix prominulo; pariete carnoso-membranaceo, ca. 12—16 μ crasso, contextu concentrice fibroso-celluloso, e cellulis plerumque valde compressis, hyalinis vel subhyalinis, pro ratione crassiuscule tunicatis, 3—7 μ longis composito; asci numerosi, cylindracei, antice truncato-rotundati, postice in stipitem usque ad 40 μ longum attenuati, tenuiter tunicati, 8-spori, p. sp. 110—145 ⇌ 11—14 μ; sporae monostichae, ellipsoideae vel oblongo-ovoideae, utrinque late rotundatae vix vel leniter attenuatae, rectae, raro inaequilaterae vel curvulae, continuae, diu hyalinae, in maturitate pallidissime brunneolae vel griseo-olivaceae, plasmate irregulariter granuloso repletae, episporio tenui, facile viescente, 13—24 ⇌ 6—11 μ; metaphyses subnumerosae, late fibrosae, tenuiter tunicatae, ut videtur, simplices nec ramosae, 2.5—5 μ latae, mox viescentes et mucosae.

Auf lebenden Blättern und dünnen Ästchen eines Strauches; Costarica: San Pedro de San-Ramon, II. 1929, leg. A. M. Brenes.

Die Stromata sind auf den Blättern aus rundlichem oder fast ellīptischem Umriss flach warzen- oder dick polsterförmig, auf den Ästchen mehr oder weniger rundlich und wesentlich grösser; sie entwickeln sich meist auf beiden Blattseiten, ursprünglich in und unter der Epidermis meist so, dass auf beiden Blattseiten eine schwarzbraune Stromakruste gebildet wird. Das auf der Blattunterseite befindliche Stroma enthält die in 1—3 Schichten angeordneten, sehr dicht gedrängt stehenden Perithezien. Die Stromakruste der Blattunterseite ist oft teilweise steril, ausgebrochen oder ganz rudimentär.

Vom Typus der Gattung unterscheidet sich der hier beschriebene Pilz hauptsächlich durch die sich in einer zusammenhängenden, schwarzbraunen, teils pseudoparenchymatischen, teils — besonders an sterilen Stellen und zwischen den Perithezien — prosenchymatischen Stromakruste entwickelnden Gehäuse und durch die nur wenig verlängerten, kaum oder undeutlich vorragenden, nicht furchigen Mündungen. Da er aber mit Rücksicht auf alle anderen, generisch

wichtigen Merkmale, als welche besonders der gallenartige Bau der Stromata, die Beschaffenheit der Fruchtschicht und der Sporen in Betracht kommen, mit der Typusart übereinstimmt, muss er auch als *Lohwagia* eingereiht und die Charakteristik dieser Gattung entsprechend geändert und ergänzt werden.

Nematostoma Singeri Petr. n. spec.

Perithecia hypophylla, rarissime etiam epiphylla, irregulariter et laxe dispersa, solitaria, raro bina complurave subaggregata, globosa, vix vel parum depressa, 180—320 μ diam., raro etiam paulo majora, diu clausa in maturitate in verticis centro poro irregulariter anguloso, interdum fere lacerato, ca. 30 μ diam., perforato praedita, extus ubique setis paucis vel subnumerosis, hyphoideis, ad basin ca. 5—7 μ crassis, atro-olivaceis, paulatim sed parum attenuatis, pallidioribus et deorsum curvatis, mox folii superficiem attingentibus, tunc saepe falcatis, plus minusve curvulis et quasi repentibus obtecta; pariete membranaceo, ca. 20 μ crasso, contextu pseudoparenchymatico, e cellulis irregulariter angulosis, pellucide atro-brunneis, vix compressis, crassiuscule tunicatis, ca. 10—20 μ diam. metientibus composito; asci subnumerosi, cylindraceo-clavati, antice late rotundati, postice in stipitem brevem, nodulosum abruptiuscule attenuati, 8-spori, p. sp. 70—90 μ, raro usque ad 115 μ longi, 14—20 μ lati; sporae plus minusve distichae, fusoideae, utrinque attenuatae et plus minusve acuminatae, rectae, raro inaequilaterae vel curvulae, 3- raro 4—5-septatae, ad septa vix constrictae, melleae vel pallide olivaceae, 28—43 ⇌ 9—11.5 μ; paraphysoides numerosae, ramosissimae, breviter articulatae, 2.5—3.5 μ, raro usque ad 4 μ crassae.

Auf lebenden Wedeln von *Dryopteris Lilloi*; Argentinien; Prov. Tucuman: Las Lenguas, 29. X. 1950, leg. R. Singer, T. 993.

Die Perithezien dieser schönen, Herrn Dr. R. Singer zu Ehren benannten Art sind überall, besonders an der unteren Hälfte, mit stark herabgekrümmten, bald die Blattfläche berührenden, radiär ausstrahlenden Borsten besetzt, welche die Funktion von Haft- oder Nährhyphen anzunehmen scheinen. Sie können zuweilen ein kleines, ganz unscharf begrenztes, auch mit der Lupe kaum wahrnehmbares Subikulum bilden, in dessen Mitte die Perithezien sitzen.

Phyllachora micropeltoidea Petr. n. spec.

Stromata semper epiphylla, irregulariter dispersa, solitaria, raro bina complurave subaggregata, sine maculis, ambitu orbicularia, semilenticularia, ut videtur, semper unilocularia, 400—650 μ diam., in centro ca. 180—260 μ alta, in epidermide evoluta; clypeo cum epidermidis pariete exteriore omnino connato, ca. 35—50 μ crasso, contextu pseudoparenchymatico, subcarbonaceo, e cellulis irregulariter

angulosis, 4—7 μ, raro usque ad 10 μ diam. metientibus, fere opace atro-brunneis composito, in marginem intraepidermalem, 90—150 μ, raro usque ad 200 μ latum transeunte; perithecia in quoque stromate solitaria, superne cum clypeo omnino connata, plus minusve convexa, inferne plana, parieti epidermidis interiori arte adnata, omnino clausa, in maturitate clypeo probabiliter irregulariter disrumpente plus minusve aperta; pariete ca. 16—25 μ crasso, subhyalino vel pallidissime flavo-brunneolo, molliter membranaceo vel subcarnoso, contextu pseudoparenchymatico, e cellulis rotundato-angulosis plus minusve compressis, pro ratione crassiuscule tunicatis, 3.5—7 μ, raro usque ad 10 μ diam. metientibus composito; asci numerosi, fusiformes vel fusoideo-clavati, utrinque plus minusve attenuati, antice rotundati, subsessiles, tenuiter tunicati, 8-spori, p. sp. 80—100 ⇌ 18—24 μ; sporae di- vel incomplete tristichae, anguste ellipsoideae, utrinque obtusae, vix vel plus minusve, postice saepe magis attenuatae, tunc subfusoideae vel oblongo-ovoideae, rectae, raro inauquilaterae vel curvulae, continuae, hyalinae, 20—27 μ, raro usque ad 30 μ longae, 6—9 μ latae, muco hyalino, ca. 2—3 μ crasso obvolutae; metaphyses subnumerosae, fibrosae, tenuiter tunicatae, 2.5—3.5 μ crassae, iam fere omnino vietae et mucosae.

Auf lebenden Blättern von *Miconia* spec.; Costarica: San José, II. 1929, leg. A. M. Brenes.

Durch den habituell an die Micropeltineen erinnernden Bau des Stromas und die grossen, schmal ellipsoidischen, oft mehr oder weniger spindeligen, nicht selten auch länglich keuligen oder länglich eiförmigen, mit homogenem, ziemlich stark lichtbrechendem Plasma erfüllten, von einer schmalen Gallerthülle umgebenen Sporen ist diese Art sehr ausgezeichnet und leicht kenntlich. Die zugehörige *Linochora*-Nebenfruchtform hat meist etwas kleinere, sonst gleich gebaute Stromata, in denen fädig-spindelige, meist gerade, beidendig scharf zugespitzte, ca. 12—18 ⇌ 2.5 μ grosse Konidien auf kurz pfriemlich-stäbchenförmigen Trägern gebildet werden. Manche Stromata enthalten ca. 150 μ grosse, nur am Scheitel mit der Innenfläche des Klypeus verwachsene, aussen mit zahlreichen locker netzig verzweigten, 2.5—3.5 μ breiten, hell olivbräunlichen Hyphen besetzte, völlig sterile Gehäuse eines Parasiten.

Phyllachora paulliniae Petr. n. spec.

Stromata amphigena sed plerumque hypophylla, in epiphyllo multo minora, punctiformia, irregulariter laxe vel dense dispersa, sine maculis in decolorationibus flavido-virescentibus, indistincte limitatis evoluta, ambitu orbicularia vel elliptica, saepe plus minusve angulosa et irregularia, solitaria vel bina complurave dense aggregata, tunc plus minusve, saepe omnino confluentia, 0.3—1.5 mm

diam., raro et plerumque confluendo tantum etiam majora; clypeo epidermali amphigeno in epiphyllo, 30—50 μ crasso, atro-brunneo, pseudoparenchymatico, e cellulis irregulariter angulosis, crassiuscule tunicatis, ca. 3—7 μ diam. metientibus composito; perithecia laxe dispersa, depresso-globosa, saepe plus minusve irregularia, 200—350 μ diam., ostiolo plano, papilliformi clypeo omnino innato-punctiformiter erumpentia; pariete molliter membranaceo, subcarnoso, hyalino vel pellucide flavido, concentrice fibroso-celluloso; asci numerosi, postice in stipitem brevem attenuati, nunc clavati, p. sp. 50—60 ⇌ 16—20 μ, nunc cylindracei, p. sp. 60—70 ⇌ 10—13.5 μ, tenuiter tunicati, 8-spori; sporae late ellipsoideae vel ovoideae, interdum fere globosae, utrinque late rotundatae, rectae, raro inaequilaterae, continuae, hyalinae, plasmate, granuloso-repletae, 10—14 ⇌ 6.5—10 μ; metaphyses numerosae, fibrosae, mox viescentes et mucosae.

Auf lebenden Blättern von *Paullinia* spec.; Costarica: Vara Blanca bei San José, II.—III. 1931, leg. H. Schmidt.

Der hier beschriebene Pilz ist mit *Ph. subrepens* Speg. und *Ph. sapindacearum* Stevens nahe verwandt, aber sicher verschieden. Die Stromata entwickeln sich der Hauptsache nach hypophyll einzeln oder in kleinen, dichten Gruppen. Auf der Oberseite sind nur unscharf begrenzte, gelbgrünliche Verfärbungen zu sehen, in deren Mitte zuweilen ein viel kleineres, punktförmiges Gegenstroma gebildet wird. Das Stroma besteht aus zwei ziemlich scharf getrennten Schichten, dem epidermalen, fast opak schwarzbraunen Klypeus und dem sich der Hauptsache nach im Schwammparenchym entwickelnden, hyalinen, faserig kleinzelligen Gewebe.

P. subrepens unterscheidet sich nach der Beschreibung durch wesentlich grössere Sporen und durch die sich hauptsächlich epiphyll entwickelnden Stromata. Nach einem mir vorliegenden Exemplar der Originalkollektion entwickeln sich die Stromata von *Ph. sapindacearum* gleichmässig auf beiden Blattseiten; das dunkel schwarzbraune Stromagewebe füllt den Raum zwischen beiden Epidermen mehr oder weniger, oft vollständig aus. Die Perithezien sind grösser, beiderseits mit dem epidermalen Klypeus verwachsen und haben eine dunkel gefärbte Membran. Bei *Ph. paulliniae* reicht die Basis der mit hyaliner oder nur sehr hell gelblich gefärbter Membran versehenen Gehäuse nur bis zum Palisadenparenchym, nie bis zur Epidermis der Gegenseite.

Coniothyrium (Cryptophaeella) nematostomatis Petr. n. spec.

Pycnidia in peritheciis *Nematostomatis Singeri* Petr. parasitantia, nunc solitaria, nunc 2—3 aggregata et plus minusve connata, globosa vel late ovoidea, e mutua pressione saepe plus minusve applanata et irregularia, 90—150 μ, raro usque ad 200 μ diam., ostiolo truncato-

conico, poro irregulariter rotundato, 15—18 μ lato perforato e matricis perithecii vertice punctiformiter erumpentia; pariete membranaceo-carnoso, 12—15 μ crasso, contextu pseudoparenchymatico, e cellulis rotundato-angulosis, pro ratione crasse tunicatis, hyalinis vel pallidissime flavidis, in ostioli apice obscure olivaceis vel atro-brunneis, vix compressis, 4.5—8 μ diam. metientibus composito; conidia numerosissima, mucoso-conglutinata, oblonga, ellipsoidea vel ovoidea, utrinque obtusa, vix attenuata, recta, rarissime inaequilatera, continua, subhyalina, in cumulo mellea, guttulis 1—2 minutis saepe indistinctis praedita 4—6 ⇌ 2.5—3.5 μ, in superficie parietis interiore oriunda.

In den Perithezien von *Nematostoma Singeri* Petr. auf lebenden Wedeln von *Dryopteris Lilloi,* Argentinien; Prov. Tucuman, Las Lenguas, 29. X. 1950, leg. R. Singer, Nr. T. 913 pp.

Dinemasporium gramineum Lév. — Auf faulenden, schon ganz morschen Halmen von *Saccharum officinarum*, Argentinien; Prov. Jujuy: Quinta pr. Laguna de la Brea, 16. VI. 1901, leg. R. E. Fries. — Diese Kollektion weicht kaum von den verschiedenen Formen des *D. hispidulum* ab. Fruchtkörper locker oder ziemlich dicht und unregelmässig zerstreut, nicht selten zu zwei oder mehreren dicht gehäuft, dann oft verwachsen oder auch zusammenfliessend, im Umriss mehr oder weniger rundlich oder breit elliptisch, bis ca. 1.2 mm Durchmesser erreichend, in der Längsrichtung des Substrates oft ziemlich stark gestreckt, dann schmal elliptisch und bis ca. 2.5 mm lang. Borsten steif, ganz gerade, aufwärts allmählich verjüngt, an der Spitze stumpf, bis ca. 200 μ lang, unten 7—10 μ, selten bis 13 μ dick, fast opak schwarzbraun. Wand des Gehäuses unten kleinzellig, gegen den Rand parallelfaserig, aus ziemlich hell graubraunen, 3—4 μ dicken, undeutlich zellig gegliederten Hyphen bestehend, die in kurze, stumpfe, bis ca. 40 μ lange, mehr oder weniger abstehende, freie, etwas abstehende Enden übergehen. Konidien 7—18 μ, selten bis 15 μ lang, 2—2.5 μ, selten bis 3 μ dick.

Diese Kollektion nimmt in bezug auf die Grösse der Konidien zwischen der typischen Form und der var. *strigosulum* Karst. eine Mittelstellung ein. *D. sacchari* P. Henn. in Hedwigia 1905, p. 71 wäre nach der Beschreibung nur durch viel kleinere Gehäuse verschieden und ist wahrscheinlich auch nur eine, durch das erwähnte Merkmal vom Typus unwesentlich abweichende Form des *D. gramineum.*

Dictyoporthe n. gen., eine neue Gattung der Diaportheen.

Von F. Petrak (Wien).

Dictyoporthe Petr. n. gen.

Stromata irregulariter dispersa, euvalsoidea, in cortice nidulantia, disco nigrescente vel obscure brunneo plus minusve erumpentia; perithecia mono- vel indistincte disticha, in ostiola crassiuscule cylindracea, plus minusve obliqua, in disco parum prominula contracta; pariete peritheciorum molliter membranaceo, pseudoparenchymatico, griseo- vel olivaceo-brunneo; asci numerosi, cylindracei vel subclavati, in stipitem brevem, crasse conicum attenuati, tenuiter tunicati, 8-spori; sporae ellipsoideae vel oblongo-ovoideae, hyalinae, plerumque rectae, pluriseptatae, septo longitudinali, incompleto divisae; pseudoparaphysae numerosae, tenuissime tunicatae, mox viescentes et mucosae.

Stromata zerstreut, euvalsoid, in der Rinde nistend, mit der schwärzlichen oder dunkelbraunen, ziemlich flachen oder etwas konvexen, breiten Mündungsscheibe durch unregelmässige Risse des Periderms hervorbrechend; Perithezien ein- oder unvollständig zweischichtig, meist ganz unregelmässig, durch gegenseitigen Druck oft stark abgeplattet oder ganz deformiert, oben in die ziemlich dick zylindrischen, punktförmig hervorbrechenden Mündungen übergehend. Perithezium membran ziemlich weichhäutig, pseudoparenchymatisch, von grau- oder olivbraunem Gewebe; Aszi zahlreich, zylindrisch oder etwas keulig, mit kurzem, dick konischem Stiel, dünnwandig, 8-sporig; Sporen ellipsoidisch oder länglich-eiförmig, meist gerade, mit mehreren Querwänden und einer unvollständigen Längswand, hyalin, $22 \rightleftharpoons 11$ µ; Pseudoparaphysen zahlreich, sehr dünnwandig, breit fädig, bald verschrumpfend und verschleimend.

Dictyoporthe Ahmadii Petr. n. spec.

Stromata laxe et irregulariter dispersa, plerumque solitaria, raro bina complurave subgregaria, e basi plus minusve orbiculari vel late elliptica depresso-conica, inferne ca. 1,5 mm lata, superne 500—800 µ diam. late truncata vel subconvexa, in cortice nidulantia, peridermio irregulariter rupto disco nigrescente vel obscure brunneo, ostiolis parum prominulis minutissime punctata plus minusve erumpentia; perithecia pauca, nunc vel indistincte disticha, raro plus minusve globosa, 250—350 µ diam., e mutua pressione valde irregularia, tunc plus

minusve angulosa, interdum valde compressa, usque ad 500 μ longa, 140—250 μ lata, antice in ostiola cylindracea, plus minusve obliqua, intus dense periphysata, sub apice plus minusve saccato-dilatata in disco punctiformiter erumpentia contracta; pariete peritheciorum molliter membranaceo, 8—12 μ crasso, contextu pseudoparenchymatico, e cellulis nunc plus minusve isodiametricis, ca. 5—13 μ diam. metientibus, nunc plus minusve elongatis, usque ad 24 μ longis, 10—16 μ latis, tenuiter tunicatis, pellucide griseo- vel olivaceo-brunneis composito; asci numerosi, cylindracei vel clavato-cylindracei, antice late rotundati, postice in stipitem crassiusculum, truncato-conicum vel fere cylindraceum, 10—20 μ longum transeuntes, tenuiter tunicati, 8-spori, p. sp. 90—120 ⇌ 16—23 μ; sporae mono- vel incomplete distichae, ellipsoideae vel oblongo-ovoideae, utrinque late rotundatae, vix vel postice tantum leniter attenuatae, rectae vel inaequilaterae, 3—5-septatae ad septa vix vel leniter constrictae, septo unico longitudinali valde incompleto, praeditae, hyalinae, 17—26.5 ⇌ 10—12 μ; pseudoparaphyses late fibrosae, subnumerosae, simplices, raro ramosae, tenuissime tunicatae, guttulas numerosas oleosas includentes, mox viescentes et mucosae.

Stromata unregelmässig und locker zerstreut, meist einzeln, selten zu 2—3 etwas dichter beisammenstehend, sich im Rindenparenchym entwickelnd, aus rundlicher oder breit elliptischer, oft ziemlich unregelmässiger Basis flach und breit abgestutzt kegelförmig, unten 1—1.5 mm, oben 500—800 μ im Durchmesser, mit der ziemlich flachen oder schwach konvexen, schwärzlichbraunen, durch die etwas vorragenden Mündungen fein punktierten Mündungsscheibe durch ganz unregelmässige Risse des Periderms mehr oder weniger hervorbrechend, der Hauptsache nach nur aus den krümeligen, von verschrumpften, ca. 3—4 μ breiten, dünnwaniden, subhyalinen oder hell olivbräunlichen Hyphen durchsetzten Substratresten, nur am Scheitel zwischen den Mündungen oft aus mehr oder weniger zusammenhängenden, pseudoparenchymatischen, grau- oder olivbraunen Komplexen bestehend. Perithezien meist 4—6, selten noch mehr in einem Stroma, ein- oder undeutlich zweischichtig, durch gegenseitigen Druck stark abgeplattet oder von zwei Seiten stark zusammengepresst und stark gestreckt, daher meist ganz unregelmässig, bis ca. 500 μ lang, 140—250 μ breit, selten fast rundlich oder eiförmig, dann ca. 250—350 μ im Durchmesser, oben in die zylindrischen, ca. 100—130 μ dicken, innen mit sehr zahlreichen, vorwärts gerichteten Periphysen erfüllten, unter der mehr oder weniger, oft scharf abgestutzten Spitze bauchig auf 140—160 μ erweiterten Mündungen zusammengezogen. Perithezienmembran weichhäutig, 8—12 μ dick, auf Querschnitten konzentrisch gebaut erscheinend, in Wirklichkeit aber aus mehreren Lagen von sehr stark zusammengepressten, teils mehr oder weniger

isodiametrischen, ca. 5—13 μ grossen, teils mehr oder weniger gestreckten, dann bis ca. 24 μ langen, 10—16 μ breiten, dünnwandigen, durchscheinend grau- oder olivenbraunen Zellen bestehend. Aszi zahlreich, zylindrisch oder keulig zylindrisch, oben breit abgerundet, unten in einen dicken, verkehrt und abgestutzt kegelförmigen oder fast zylindrischen, nicht knopfförmig endenden, 10—20 μ langen Stiel übergehend, dünn- und zartwandig, 8-sporig, p. sp. 90—120 ⇌ 16—23 μ; Sporen 1- oder unvollständig 2-reihig, ellipsoidisch oder länglich eiförmig, beidendig breit abgrundet, nicht oder nur unten schwach verjüngt, gerade oder ungleichseitig, mit 3—5 Querwänden und einer unvollständigen, oft schiefen Längswand, nicht oder nur sehr schwach eingeschnürt, mit undeutlich körnigem, stark lichtbrechendem Plasma, hyalin, 17—26 ⇌ 10—12 μ; Pseudoparaphysen ziemlich zahlreich, breit fädig, einfach oder etwas ästig, sehr zartwandig, viele, verschieden grosse Öltröpfchen enthaltend, 2.5—5 μ breit, bald verschrumpfend und verschleimend.

Auf dürren, dünnen Ästchen von *Spiraea* spec.; Pakistan; Kagan Valley, Shogran, 16. VII. 1951, leg. S. Ahmad.

Der hier beschriebene, prächtig entwickelte, aber wohl noch etwas junge Pilz ist eine ganz typische Diaporthee mit euvalsoiden Stromata, die durch ganz unregelmässige Risse des pustelförmig aufgetriebenen Periderms am Scheitel mehr oder weniger frei werden; eine stromatische Grenzlinie ist nicht vorhanden. Durch die mauerförmig geteilten Sporen ist *Dictyoporthe* sehr ausgezeichnet und von anderen Diaportheen-Gattungen sehr leicht zu unterscheiden.

Neue Mikromyzeten der australischen Flora.

Von F. Petrak (Wien).

In letzter Zeit hat mir Herr Prof. Dr. E. Gauba wieder mehrere reichhaltige Kollektionen von Pilzen gesendet, die er in verschiedenen Teilen Australiens gesammelt hat. In der folgenden Aufzählung werden einige, für die Wissenschaft neue Arten beschrieben. Für das schöne, meist sehr reichlich aufgelegte, vorzüglich präparierte Material spreche ich Herrn Prof. Gauba auch hier meinen herzlichsten Dank aus.

Albugo hydrocotyles Petr. n. spec.

Sori, ut videtur, semper hypophylli, irregulariter et laxe vel subdense dispersi, primo decolorationes flavo-viridulas, nervis arte limitatas, quoad formam et magnitudinem variabiles, plerumque omnino irregulares, raro fere obriculares vel ellipsoideas, ca. 1.5—8 mm diam. metientes, saepe confluentes, tunc etiam majores et magnam folii partem occupantes, postea in maculas brunneas vel fere nigrescentes transeuntes efficientes, in epidermide evoluti, ambitu orbiculares vel elliptici, saepe plus minusve irregulares, deplanato-vesiculosi, albidi vel pallidissime flavescentes, primo pariete epidermidis exteriore pustulatim elevata tecti, denique epidermidem disrumpentes et conidia matura ejicientes; conidia globosa vel late ellipsoidea continua, 11—21 μ diam., hyalina, episporio levi, medio annulato-incrassato.

Auf lebenden Blättern von *Hydrocotyle laxiflora,* A.C.T. Brindabella Range, 11. I. 1955.

Auf dem mnr vorliegenden, ziemlich zahlreichen Material konnten Oosporen auch in den ältesten Flecken nicht gefunden werden.

Apiospora liliacearum Petr. n. spec.

Stromata irregulariter et laxe dispersa, plerumque solitaria, raro 2—3 aggregata, tunc saepe plus minusve confluentia et majora, in et sub epidermide evoluta, quoad formam et magnitudinem variabilia, 0.6—3 mm diam., raro usque ad 4 mm longa, 0.3—1 mm, raro usque ad 2 mm lata, plerumque longitudinaliter plus minusve protracta, anguste striiformia vel ellipsoidea, raro fere orbicularia, tunc plus minusve saepe omnino irregularia, clypeo cum epidermidis pariete exteriore connato, ca. 20—60 μ crasso, contextu nunc parce evoluto

et plus minusve hyphoideo, nunc bene evoluto, contextu pseudoparenchymatico, e cellulis rotundato-angulosis, ca. 3.5—7 μ diam. metientibus, tenuiter tunicatis, atro-brunneis composito; perithecia monosticha, dense stipata, saepe in series longitudinales, parallelas ordinata, globosa vel late ellipsoidea, vix vel plus minusve compressa, ostiolo papilliformi, clypeo innato punctiformiter erumpentia, 130—250 μ diam.; pariete molliter membranaceo, ca 12—20 μ crasso, pseudoparenchymatico, e cellulis rotundato-angulosis, valde compressis, extus subhyalinis, intus pellucide olivaceis vel griseo-brunneis, 5—12 μ longis composito; asci subnumerosi, clavati vel oblongo-fusoidei, antice late rotundati, vix vel parum, postice distincte attenuati, subsessiles, crassiuscule tunicati, 4—8-spori, p. sp. 65—95 ⇌ 16—23 μ; sporae plus minusve distichae, oblongo-ovoideae, vel anguste ellipsoideae, utrinque obtusae, antice non vel parum, postice distincte et paulatim attenuatae, inaequilaterae vel curvulae, raro rectae, prope basin septatae, plus minusve constrictae, loculo infero ca. 4.5—6 μ lato, fere hemisphaerico, papilliformi, plasmate homogeneo minutissime granuloso repletae, 21—27 ⇌ 6—9.5 μ, muco hyalino, gelatinoso, 3—5 μ crasso obvolutae; metaphyses numerosae, guttulis oleosis, numerosis praeditae sed iam valde mucosae, vix conspicuae.

Auf dürren Ranken von *Geitonoplesium cymosum;* NSW: Kangaroo Valley, 21. IV. 1955. — Auf dürren Ranken von *Smilax australis*; NSW.: Cabbage Tree Creek, 18. V. 1955.

Dass die hysterioide Form der auf Halmen von Gräsern wachsenden *Apiospora*-Arten vor allem durch die Beschaffenheit dieser Substrate bedingt wird, zeigt sich bei dem oben beschriebenen Pilze sehr deutlich, dessen Stromata eine sehr verschiedene Form haben und zuweilen denen einer *Diaporthe* sehr ähnlich werden können. Der Klypeus ist zuweilen sehr schwach entwickelt und dann oft nur durch eine schwärzliche Saumlinie angedeutet. Das innere Stromagewebe ist grosszellig pseudoparenchymatisch und mehr oder weniger hell gefärbt, oft subhyalin. Bisweilen ist es stark reduziert, von grösseren oder kleineren Hohlräumen unterbrochen, zeigt dann eine mehr oder weniger plektenchymatische Beschaffenheit und besteht aus ca. 2—3 μ dicken, reich verzweigten und verflochtenen Hyphen.

Diaporthe pimeleae Petr. n. spec.

Stromata maculiformia, minuta, irregulariter et laxe dispersa, plerumque solitaria, 1—4 mm diam., raro et plerumque confluendo tantum majora, extus vix conspicua, linea atra, stromatica, varie tortuosa, in cortice et ligno evoluta limitata; perithercia 1—5 in quoque stromate, laxe vel subdense distributa, monosticha, in cortice nidulantia vel etiam ligno plus minusve infossa, globosa vel late ellipsoidea, plus minusve depressa, 180—250 μ diam., ostiolo breviter

cylindraceo, in apice saepe leniter dilatato, nec prominulo punctiformiter erumpentia; pariete molliter membranaceo, ca. 10 μ crasso, contextu pseudoparenchymatico, e cellulis inferne flavo-brunneolis, interdum fere subhyalinis, superne plus minusve obscure atro-brunneis, rotundato-angulosis, 5—12 μ diam. metientibus, pro ratione crassiuscule tunicatis, plus minusve compressis composito; asci numerosissimi, fusiformes, utrinque plus minusve attenuati et obtusi, 8- raro 4—6-spori, 40—50 ⇌ 6—7 μ; sporae incomplete distichae, oblongo-fusoideae, utrinque attenuatae, rectae, raro inaequilaterae vel curvulae, medio septatae, non vel lenissime constrictae, 7—11 ⇌ 3—5 μ.

Auf dürren Ästchen von *Pimelea ligustrina;* NSW.: Kangaroo Valley, 1. IV. 1955.

Der unscheinbare Pilz ist äusserlich nur durch die undeutlichen Grenzlinien des Stromas, seltener auch durch die punktförmigen, schwärzlichen Mündungen der zuweilen auch schwach pustelförmig vorgewölbten Perithezien zu erkennen.

Leptosphaeria dichosciadii Petr. n. spec.

Perithecia amphigena, irregulariter et laxe dispersa, solitaria, raro 2—3 subaggregata, subepidermalia, depresso-globosa vel late ellipsoidea, ca. 160—250 μ diam., interdum subirregularia, ostiolo papilliformi, antice late rotundato vel subtruncato, poro irregulariter rotundato, 20—30 μ lato aperto punctiformiter erumpentia; pariete membranaceo, ca. 10—12 μ crasso, contextu pseudoparenchymatico, e cellulis irregulariter angulosis, tenuiter tunicatis, 6—12 μ, raro usque ad 20 μ diam. metientibus, plus minusve compressis, pellucide atro-brunneis composito; asci pauci, crasse clavati vel clavato-cylindracei, antice late rotundati, postice saepe parum sed distincte saccati, subsessiles, 8-spori, 80—110 ⇌ 23—30 μ; sporae incomplete distichae, fusoideae, utrinque attenuatae et obtusae, rectae vel inaequilaterae, raro curvulae, diu hyalinae et 1-septatae, denique olivaceae et triseptatae, ad septum medium leniter sed plerumque distincte, ceterum non vel vix constrictae, episporio fere 1 μ crasso, 38—50 ⇌ 10—12 μ; paraphysoides paucae, fibroso-cellulosae, mox viescentes et mucosae.

Auf abgestorbenen Blättern von *Dichosciadium ranunculaceum*; N.S.W. Mt. Kosciusko, xa. 7000 ft., 29. III. 1955.

Die Sporen dieser Art bleiben sehr lange hyalin und sind nur mit der mittleren Querwand versehen. Sie enthalten ein homogenes, ziemlich feinkörniges Plasma und haben ein deutlich sichtbares, ca. 1 μ dickes Epispor. Erst spät werden sie olivbraun und erhalten in jeder Hälfte noch eine sekundäre Querwand.

Leptosphaeria Gaubae Petr. n. spec.

Perithecia irregulariter et laxe dispersa, solitaria vel 2—3 seriatim disposita, tunc plus minusve aggregata et connata, subepidermalia, globosa vel late ellipsoidea, interdum plus minusve irregularia, vix vel parum depressa, 200—300 μ diam., raro etiam paulo majora, ostiolo plano, papilliformi vel truncato-conico, poro irregulariter rotundato, ca. 25 μ lato perforato punctiformiter erumpentia, extus hyphis paucis brevibus, simplicibus, raro furcatis, atro-olivaceis, ca. 5—7 μ crassis, breviter articulatis praedita; pariete plerumque ca. 25 μ crasso, membranaceo, contextu pseudoparenchymatico, e cellulis irregulariter angulosis, tenuiter tunicatis, ca. 6—12 μ diam. metientibus vel plus minusve elongatis, tunc usque 25 μ longis, 10—16 μ latis, non vel leniter compressis, pellucide atro-brunneis composito; asci subnumerosi, cylindraceo-clavati, antice late rotundati, postice in stipitem brevem usque ad 10 μ longum, crassiuscule nodulosum contracti, p. sp. ca. 130—150 ⇌ 26—32 μ; sporae plus minusve di- raro fere monostichae, fusoideo-oblongae, utrinque obtusae et plus minusve attenuatae, 3-septatae, ad septa leniter, medio saepe magis constrictae, amoene olivaceae, loculo secundo maximo, sed vix prominulo, plasmate homogeneo, minutissime granuloso repletae, episporio 2.5—3 μ crasso, 32—40 μ, raro usque ad 46 μ longae, 14—16 μ crassae; paraphysoides paucae, fibrosae, ramosae, ca. 2.5—3.5 μ crassae, mox viescentes et mucosae.

Auf dürren Blättern von *Danthonia frigida*; N.S.W. Mt. Kosciuko, 6000 ft., 29. III. 1955.

Das mir vorliegende, ziemlich reichliche Material dieser Art ist leider noch ziemlich jung und zum Teil auch mehr oder weniger verdorben. Die meisten Perithezien enthalten nur verschrumpfte Aszi und Sporen. Gut entwickelte Gehäuse sind zwar vorhanden, aber nur ganz zufällig zu finden.

Mycosphaerella brachycomes Petr. n. spec.

Perithecia irregulariter et laxe dispersa, solitaria, raro bina complurave subaggregata, subepidermalia, globosa vel late ellipsoidea, ostiolo plano, papilliformi saepe indistincto, poro irregulariter rotundato, ca. 12—16 μ lato perforato punctiformiter erumpentia, 70—90 μ diam., raro etiam paulo majora, extus hyphis simplicibus vel parce ramosis, tenuiter tunicatis, melleis vel pallide olivaceis, remote vel subdense septatis praedita: pariete membranaceo, ca. 10—13 μ crasso, contextu pseudoparenchymatico, e cellulis irregulariter angulosis, tenuiter tunicatis, vix compressis, pellucide atro-brunneis, 7—15 μ, raro usque ad 20 μ diam. metientibus composito; asci subnumerosi, cylindraceo-obclavati, antice late rotundati, postice plus minusve saccati, subsessiles, crasse tunicati, 8-spori, 26—40 ⇌ 7—10 μ, sporae di-

vel indistincte tristichae, oblongo-clavatae, utrinque obtusae, antice vix, postice leniter, sed plerumque manifeste attenuatae, rectae, raro curvulae, medio septatae, non vel lenissime constrictae, hyalinae, 5—8 ⇌ 3—3.5 μ; paraphysoides paucae, indistincte fibrosae, mox mucosae.

Auf dürren Stengeln von *Brachycome diversifolia* var. *diversifolia*; A.C.T., Mt. Coree, 4500 ft., 22. XII. 1954.

Eine sehr unscheinbare, auch mit der Lupe nicht leicht zu findende Art, die besonders durch ihre kleinen Sporen gut charakterisiert ist.

Mycosphaerella dianellincola Petr. n. spec.

Perithecia, ut videtur, semper epiphylla, raro solitaria, plerumque bina complurave dense aggregata, plus minusve connata et caespitulos minutos, ambitu omnino irregulares, raro plus minusve rotundatas formantia, subepidermalia, ca. 70—120 μ diam., globosa vel late ellipsoidea, ostiolo plano, saepe indistincto, poro irregulariter rotundato, ca. 20 μ lato perforato praedita; periete membranaceo, ca. 12 μ crasso, contextu pseudoparenchymatico, e cellulis rotundato-angulosis, crassiuscule tunicatis, 4—8 μ diam. metientibus, pellucide atro-brunneis, vix compressis composito; asci pauci, obclavati, antice late rotundati, postice plus minusve saccati, 8-spori, 30—40 ⇌ 10—13 μ; sporae di- vel indistincte tristichae, clavato-oblongae, utrinque obtusae, vix vel parum subfusoideae, rectae, raro curvulae, hyalinae, medio septatae, non vel lenissime constrictae, 9—13.5 ⇌ 3—4.5 μ; paraphysoides pro ratione numerosae, fibroso-cellulosae, mox mucosae.

Auf dürren Blättern von *Dianella revoluta;* N.S.W.: Wyalong, 7. V. 1955.

Sehr charakteristisch für diese, nur in jungem Zustande vorliegende Art ist ihr Wachstum; mehr oder weniger zahlreiche Perithezien sind dicht gehäuft, miteinander verwachsen und bilden kleine, punktförmige, im Umriss meist ganz unregelmässige, selten fast rundliche Stromata.

Anthostomella wyalongensis Petr. n. spec.

Perithecia irregulariter et laxe dispersa, solitaria, raro 2—3 subaggregata, subepidermalia, globosa vel late ellipsoidea, plus minusve depressa, clypeo imprimis epidermali, indistincte limitato, atro-brunneo, vix nitidulo tecta, 250—350 μ diam., raro etiam paulo majora, ostiolo papilliformi vel truncato-conico, poro irregulariter rotundato, ca. 20—30 μ lato perforato in clypei centro punctiformiter erumpentia; pariete molliter membranaceo vel fere carnosulo, ca. 20 μ crasso, contextu pseudoparenchymatico, e cellulis rotundato-angulosis, tenuiter tunicatis, plus minusve compressis, subhyalinis vel pallide flavo-brunneolis, ca. 6—14 μ diam. metientibus, superne paulatim minori-

bus et obscurius coloratis, in verticis centro olivaceis, 4—7 μ diam. metientibus composito; asci numerosi, cylindracei, antice truncati, postice in stipitem nodulosum, crassiusculum, ca. 13—30 μ longum transeuntes, tenuiter tunicati, 8-spori, p. sp. 95—115 ⇌ 15—18 μ; sporae monostichae, ellipsoideae, ovoideae, utrinque late rotundatae, vix vel lenissime attenuatae, rectae, raro inaequilaterae, fere opace atro-brunneae, continuae, muco gelatinoso, hyalino, ca. 3.5 μ crasso obvolutae, 13—17 ⇌ 7.5—10 μ, a latere non vel lenissime compressae; metaphyses numerosae, late fibrosae, plasmate laxe granuloso et guttulis oleosis, numerosis praedita, indistincte articulatae, tenuissime tunicatae, mox viescentes et mucosae.

Auf dürren Blättern von *Dianella revoluta;* N.S.W.: Wyalong, 7. V. 1955.

Der rundliche oder breit elliptische Klypeus löst sich am Rande nach allen Seiten in locker netzartig verzweigte, septierte, durchscheinend schwarzbraune, 2—3.5 μ breite Hyphen auf. Die Membran ist unten und an den Seiten fast bis zum Rande des Scheitels subhyalin oder nur sehr hellbräunlich gefärbt.

Acrospermum Gaubae Petr. n. spec.

Ascomata semper hypophylla, irregulariter et laxe dispersa, solitaria, folii indumento adnata vel plus minusve innata, lageniformia, sessilia, ca. 100—300 μ alta, prope basin 130—170 μ lata, obscure rufobrunnea, primo clausa, in maturitate rotundato-aperta, tunc saepe fere cylindracea; pariete gelatinoso-carnoso vel subcartilagineo, 25—35 μ crasso, ad basin hyphis hyalinis simplicibus vel ramosis, in folii indumento repentibus, 2.5—3.5 μ crassis, tenuiter tunicatis, indistincte septatis praedita, contextu pseudoparenchymatico, e cellulis extimis rufescentibus vel obscure aurantiacis, interioribus subhyalinis vel dilutissime flavidis, crassiuscule tunicatis, 3—6 μ diam. metientibus, non compressis composito; asci numerosi anguste elongato-cylindracei, antice late rotundati, postice in stipitem ca. 9—15 μ longum attenuati, crassiuscule tunicati, 4-spori, ca. 110—140 ⇌ 6—7 μ; sporae irregulariter flexuosae, filiformes, hyalinae, fere ascorum longitudine, septis numerosis in articulos ca. 5—8 μ raro usque ad 10 μ longos, 1.5—2 μ crassos divisae; paraphyses numerosae, filiformes, ascos vix vel parum superantes, ca. 1 μ crassae, sero mucosae.

Auf lebenden und abgestorbenen, noch hängenden Blättern von *Banksia ericifolia*; Pigeon House Range, 4. VIII. 1954.

Die rotbraune oder schmutzig orangerote Aussenkruste der Fruchtkörper scheint im Alter spröde zu werden und wird dann von vielen, regellos verlaufenden, zarten Rissen durchzogen. Die Zellen der Wand sind zuweilen etwas gestreckt und dann mehr oder weniger mäandrisch gekrümmt.

Scelobelonium australiense Petr. n. spec.

Apothecia irregulariter et laxe dispersa, solitaria, stipite ca. 300—600 μ longo innata, ceterum omnino superficialia, primo subglobosa, mox cupulata, denique plus minusve explanata, 0.5—1.5 mm diam., forsan etiam paulo majora, olivaceo-brunnea, disco orbiculari, obscure griseo vel olivaceo, glabrescentia, ad marginem minute eroso-crenulata vel obtuse denticulata et sinuosa; excipulo inferne pseudoparenchymatico, e cellulis extus pellucide olivaceis, intus hyalinis vel subhyalinis, 5—12 μ diam. metientibus, rotundato-angulosis, pro ratione crassiuscule tunicatis composito, superne marginem versus prosenchymatico ibique ex hyphis rectiusculis parallelis, breviter articulatis, obscure atro-brunneis, 3—5 μ crassis composito; hypothecio hyalino, indistincte fibroso-celluloso; asci cylindracei vel clavato-cylindracei, antice late rotundati, postice plus minusve distincte, abruptiuscule in stipitem ca. 5 μ longum contracti, crassiuscule tunicati, 8- raro 4—6-spori, p. sp. 95—115 ⇌ 13—16 μ; sporae cylindraceo-fusoideae, utrinque obtusae, vix vel leniter attenuatae, raro inaequilaterae vel curvulae, 3-septatae, non constrictae, amoene et obscure olivaceae, 20—27 μ, raro usque ad 30 μ longae, 5—6.5 μ latae, episporio 1 μ crasso; paraphyses numerosae, fibrosae, hyalinae, ca. 1.5—2 μ crassae, simplices vel ramosae, superne subito clavato-incrassatae ibique ca. 4—7 μ crassae et obscure olivaceae, epithecium manifestum olivaceum formantes.

Auf dürren Halmen von *Danthonia nudiflora;* N.S.W.: Mt. Kosciusko, 6000 ft., 29. III. 1955.

Der prächtig entwickelte, leider nur sehr spärlich vorhandene Pilz scheint der Typusart *Sc. melanosporum* (Rehm) v. H. sehr nahe zu stehen, aber durch grössere, dunkler gefärbte Apothezien und etwas längere Sporen hinreichend verschieden zu sein.

Diplodina danthoniae-frigidae Petr. n. spec.

Pycnidia irregulariter dispersa, nunc solitaria, nunc bina complurave plus minusve aggregata, tunc plerumque seriatim disposita, plus minusve connata et mutua pressione saepe applanata et irregularia, subepidermalia, globosa vel late ellipsoidea, vix vel parum depressa, ca. 70—160 μ diam., raro paulo majora, ostiolo ca. 30—45 μ alto, cylindraceo-conico, antice plus minusve truncato, poro irregulariter rotundato ca. 20 μ lato perforato punctiformiter erumpentia; pariete tenuiter membranaceo, 6—8 μ crasso, e cellulis irregulariter angulosis, tenuiter tunicatis, plus minusve compressis, pellucide griseo-nigrescentibus, 7—15 μ diam. metientibus composito; conidia numerosa, oblongo-fusoidea, utrinque attenuata, obtusiuscula vel subacuminata, recta, raro inaequilatera, medio septata, vix constricta, hyalina, plasmate homogeneo, minutissime granuloso repleta, episporio fere 1 μ

crasso, 14—20 ⇌ 5—7.5 μ; conidiophora totam parietis superficiem interiorem obtegentia, bacillari-filiformia, simplicia, 4—7 ⇌ 1.5—2 μ.

Auf dürren Halmen und Blättern von *Danthonia frigida*; Mt. Kosciusko, N.S.W., ca. 6000 ft., 29. III. 1955.

Diese schöne, in Gesellschaft verschiedener Pilze wachsende Art ist besonders durch die beidendig ziemlich stark verjüngten, oft stumpf zugespitzten, mit deutlich sichtbarem Epispor versehenen, ein homogenes, feinkörniges, ziemlich stark lichtbrechendes Plasma enthaltenden Konidien gut charakterisiert und vom gewöhnlichen *Diplodina*-Typus wesentlich verschieden.

Pleurodiscus amperae Petr. n. spec.

Pycnostromata irregulariter et laxe dispersa, solitaria plus minusve globosa, late ovoidea vel irregulariter tuberiformia, ca. 180—300 μ diam., raro etiam paulo majora, basi plus minusve angustata cortici innata, mox erumpentia et quasi superficialia, primo clausa, in maturitate probabiliter e verticis centro irregulariter dilabentia; loculo processubus parietis plus minusve numerosis nunc paulo, nunc magis prominulis, hyalinis, fibroso-cellulosis plus minusve sinuato et lobato; pariete ca. 30—90 μ crasso, gelatinoso-subcartilagineo, contextu pseudoparenchymatico e cellulis rotundato-angulosis, extus olivaceis, intus paulatim pallidioribus subhyalinis, vix compressis, 3—7 μ diam. composito, matricis reliquias numerosas omnino vietas includente; conidia acrogena, numerosissima, bacillaria, utrinque obtusa, recta, raro curvula, continua, hyalina, 3—4 ⇌ 1 μ; conidiophora totam loculi superficiem interiorem densissime obtegentia, simplicia vel ramosa, 15—20 ⇌ 1.5 μ, ramis subulato-filiformibus, ca. 5—12 μ longis.

Auf dürren Ästchen von *Ampera xiphoclada*; N.S.W.: near Marulan, in forest, 2. I. 1955.

Unterscheidet sich vom Typus der Hauptsache nach nur durch relativ kleine, rundliche, nicht niedergedrückt polster- oder scheibenförmige Fruchtkörper.

Septoria schizeilematis Petr. n. spec.

Maculae amphigenae, irregulariter et laxe dispersa, saepe e folii margine oriundae, orbiculares vel ellipticae, saepe plus minusve irregulares, primo alutaceae, postea expallescentes, flavidae vel albidae, linea elevata, vix vel parum obscuriore arte limitatae, 0.5—2 mm diam., confluendo etiam majores et omnino irregulares; pycnidia laxe vel subdense dispersa, in macularum centro saepe aggregata, subepidermalia, globosa, vix vel parum depressa, ostiolo plano, papilliformi, poro irregulariter rotundato ca. 15 μ lato perforato punctiformiter erumpentia; pariete tenuiter membranaceo, ca. 5—10 μ crasso,

contextu pseudoparenchymatico, e cellulis irregulariter angulosis, tenuiter tunicatis, plus minusve compressis, 3.5—7 μ, raro usque ad 10 μ diam., metientibus, pellucide ochraceo-brunneis vel olivaceis composito; conidia numerosissima, tenuiter filiformia vel acicularia, antice paulatim acuminata, postice obtusiuscula, plus minusve recta, leniter arcuata vel sigmoidea, hyalina, continua, 23—58 ⇌ 1—1.5 μ, in cellulis minute papilliformibus superficiei parietis interioris oriunda.

Auf lebenden und absterbenden Blättern von *Schizeilema fragoseum*; N.S.W.: Mt. Kosciusko, 7000 ft., 15. III. 1955.

Auf manchen Blättern wurden auch Spuren einer alten, wohl auch schlecht entwickelten *Ramularia* gefunden.

Septoria canberrica Petr. n. spec.

Pycnidia late et subdense dispersa, solitaria, raro bina complurave subaggregata, subepidermalia, globosa vel late ellipsoidea, 80—150 μ diam., vix vel parum depressa, in vertice fere disciformiter deplanata ibique in maturitate poro irregulariter rotundato, 30—50 μ lato aperta, extus hyphis reticulato-ramosis, breviter articulatis, 3—6 μ, raro usque ad 9 μ crassis praedita; pariete membranaceo, ca. 10—12 μ crasso, contextu pseudoparenchymatico, e cellulis rotundato-angulosis, vix compressis, tenuiter tunicatis, pellucide olivaceis, 5—8 μ, raro usque ad 10 μ diam. metientibus composito; conidia filiformia, utrinque obtusiuscula, non vel lenissime attenuata, recta, raro arcuato-curvula, hyalina, continua vel 1—3-pseudoseptata, 12—30 μ, raro usque ad 36 μ longa, 1.5—2 μ lata.

Auf dürren Stengeln von *Pelargonium australe:* A.C.T.: Mt. Coree bei Canberra, ca. 6000 ft., 21. X. 1954.

Dieser Pilz gehört als Nebenfruchtform zu einer *Mycosphaerella,* die am vorliegenden Material ganz unreif ist und nur junge Aszi ohne Sporen zeigt. Von *Septoria pelargonii* Syd. in Ann. Myc. X. p. 443 (1912) unterscheidet er sich durch viele kleinere, meist gerade, nicht stark gekrümmte Konidien und wahrscheinlich auch durch typisch pseudoparenchymatisch gebaute Gehäuse.

Coniella australiensis Petr. n. spec.

Pycnidia irregulariter et laxe dispersa, solitaria, raro bina complurave subaggregata, subepidermalia, depresso-globosa, primo clausa, postea in centro verticis poro irregulariter rotundato, ca. 28—35 μ lato aperta, 140—200 μ diam., 60—90 μ alta, imprimis ad basin hyphis nonnullis simplicibus vel parce ramosis, indisticte septatis, 2.5—4 μ crassis, melleis vel pallide olivascentibus obtectae; pariete membranaceo, ad latera et in vertice ca. 4—6 μ, ad basin e margine centrum versus paulatim usque ad 15 μ incrassato, contextu pseudoparenchymatico, e cellulis tenuiter tunicatis, nunc fere isodiametricis, 6—13 μ

diam. metientibus, nunc plus minusve protractis, ca. 14—20 µ longis, 4—8 µ latis, saepe indistincte maeandrice ordinatis composito; conidia acrogena, late ovoidea, ellipsoidea vel subglobosa, antice latissime rotundata, postice saepe abruptiuscule in papillulam minutissimam protracta, ab uno latere saepe convexa ab altero concava vel applanata, interdum indistincte angulosa, tunc plus minusve irregularia, pellucide olivacea, plerumque guttula oleosa centrali praedita, 10—14 ⇌ 7—11 µ vel ca. 9—12 µ diam.; conidiophora in superficie parietis basali tantum evoluta, simplicia, e basi ca. 2.5—3 µ lata abruptiuscule attenuata, filiformia, 12—16 µ, raro ad 20 µ longa, superne 1—1.5 µ crassa, sero mucosa.

Auf dürren Stengeln von *Pelargonium australe*. A.C.T.; Canberra: Mt. Coree, ca. 6000 ft., 20. I. 1954.

Auf den zahlreichen, mir vorliegenden Stengeln der oben zitierten Kollektion waren verschiedene Pilze teils reichlich, teils nur sehr spärlich vorhanden. Von der hier beschriebenen *Coniella* konnte leider nur ein kleines, ca. 5 cm langes Stengelfragment gefunden werden. Sie unterscheidet sich von den wenigen, bisher bekannt gewordenen Arten der Gattung besonders durch die relativ grossen, dunkel gefärbten Konidien. Die Träger entspringen auf einem flach konvexen, in der Mitte ca. 18—25 µ dicken Gewebspolster, der aus 3—6 µ grossen, aussen olivbraunen, innen plötzlich hyalin werdenden Zellen besteht.

Coniothyrium pelargonii Petr. n. spec.

Pycnidia irregulariter et laxe dispersa, solitaria vel saepe bina complurave plus minusve aggregata et connata, subepidermalia, depresso-globosa vel late ellipsoidea, 70—130 µ, raro usque ad 150 µ diam., ostiolo plano, papilliformi, saepe indistincto, poro irregulariter rotundato, ca. 12—18 µ lato perforato punctiformiter erumpentia, extus imprimis ad verticis marginem hyphis reticulato-ramosis, 3—7 µ crassis, tenuiter tunicatis, melleis vel flavo-brunneolis, breviter articulatis praedita; pariete membranaceo, 6—10 µ crasso, contextu pseudoparenchymatico, pellucide olivaceo, e cellulis irregulariter angulosis, plus minusve compressis, ca. 5—10 µ, raro usque ad 13 µ diam. metientibus, tenuiter tunicatis composito; conidia numerosa, mucoso-conglutinata, oblongo-ellipsoidea vel oblongo-ovoidea, utrinque obtusa vel postice tantum leniter attenuata, recta, raro inaequilatera, continua, castaneo-brunnea, plerumque guttulis oleosis, pro ratione majusculis praedita, 6—9.5 ⇌ 3.5—5 µ, in cellulis parietis superficiei interioris saepe leniter papilliformiter prominulis oriunda.

Auf dürren Stengeln von *Pelargonium australe*. A.C.T.; Canberra: Mt. Coree, ca. 6000 ft., 11. X. 1954.

Wächst in Gesellschaft einer unreifen *Mycosphaerella,* deren Nebenfruchtform *Septoria canberrica* und einer unreifen Pleosporacee, welche die zu *Coniothyrium pelargonii* gehörige Schlauchform sein dürfte.

Stagonospora danthoniae-frigidae Petr. n. spec.

Pycnidia irregulariter et laxe dispersa, solitaria vel bina complurave subaggregata et in series longitudinales ordinata, subepidermalia, globosa vel late ellipsoidea, vix vel parum depressa, ostiolo cylindraceo-conico, poro irregulariter rotundato, ca. 25 μ lato perforato punctiformiter erumpentia; pariete membranaceo, ca. 20 μ crasso, contextu pseudoparenchymatico, e cellulis rotundato-angulosis, vix vel parum compressis, tenuiter tunicatis, pellucide griseo-olivaceis, 6—13 μ, raro usque ad 20 μ diam. metientibus composito; conidia subnumerosa, cylindracea vel cylindraceo-subfusoidea, utrinque obtusa et plus minusve attenuata, recta, raro curvula, 5- raro 6-septata, non contracta, hyalina, plasmate homogeneo, minute granuloso repleta et guttulis oleosis majusculis praedita, 40—52 ⇌ 9—11 μ, episporio manifeste conspicuo, ca. 0.5 μ crasso.

Auf dürren Halmen und Blättern von *Danthonia frigida;* N.S.W.: Mt. Kosciusko, ca. 6000 ft., 29. III. 1955.

Diese Art steht der *St. dolosa* Sacc. et Roum. nahe, unterscheidet sich aber von ihr durch kleinere Pykniden und wesentlich kürzere Konidien.

Trullula australiensis Petr. n. spec.

Pycnidia irregulariter dispersa, solitaria, raro bina complurave subaggregata, tunc saepe plus minusve seriatim disposita, subepidermalia, cortici plus minusve innata, 180—300 μ, raro usque ad 600 μ diam. metientia, in maturitate usque ad marginem patelliformiter aperta et conidiorum massam mucosam, viridulo-atram, subglobosam ejicientia, ob rugas strati basalis plus minusve prominulas saepe incomplete loculata; strato basali nunc vix, nunc bene evoluto, tunc ca. 10—20 μ crasso, subhyalino, contextu pseudoparenchymatico, e cellulis rotundato-angulosis, tenuiter tunicatis, hyalinis, 3—5 μ diam. metientibus composito, cum matricis reliquiis omnino vietis aurantiacis vel obscure ferrugineis connato, inferne in hyphas laxe ramosas, tenuissimas, hyalinas ca. 1.5 μ crassas transeunte; conidia numerosissima, mucoso-conglutinata, breviter cylindracea, utrinque truncata, recta, raro inaequilatera, continua, subhyalina, in cumulo virdidulo-olivacea, 3.5—5 μ, raro usque ad 6.5 μ longa, 2—3.5 μ lata, catenulatim e conidiophoris elongatis furcatis vel varie ramosis superficiem strati basalis interiorem densissime obtegentibus, ca. 2—2.5 μ latis oriunda.

Auf dürren Ästchen von *Daviesia latifolia;* N.S.W.: in forests East of Goulburn, 16. II. 1951.

Auf dem mir vorliegenden, ziemlich spärlichen Material konnte ich nur gut ausgereifte, weit offene, von den zurückgebogenen oder etwas eingerollten Lappen der zersprengten Epidermis berandete Fruchtkörper finden. Auf der Innenseite der aufgebogenen Epidermis ist bei vielen, offenbar jüngeren Fruchtkörpern eine ca. 30—45 μ dicke, vollkommen hyaline Schicht von sehr dickwandigen, sehr englumigen, 10—15 μ, seltener bis ca. 20 μ grossen Zellen vorhanden, deren enges, oft etwas gestrecktes Lumen ca. 2—4 μ weit ist. Ich vermute daher, dass junge Fruchtkörper nicht nur von der Epidermis, sondern auch von der oben erwähnten hyalinen Zellschicht bedeckt, also völlig geschlossen sein dürften. Bei der Reife wird durch die sich entwickelnden Konidienmassen die sicher stark quellbare Deckschicht mit der Epidermis zersprengt und bis zum Rande eingerollt oder aufgebogen.

Ramularia dichosciadii Petr. n. spec.

Maculae irregulariter laxe vel dense dispersae, utrinque visibiles, griseo-olivaceae vel obscure brunneae, plerumque angulosae et omnino irregulares, saepe nervos sequentes et plus minusve protractae, 1—3 μ diam., confluendo etiam majores, tunc interdum magnam folii partem occupantes; caespituli amphigeni, dense dispersi vel gregarii, albidi, hypostromate ca. 15—30 μ diam., raro paulo majore, contextu pseudoparenchymatico vel indistincte prosenchymatico, e cellulis irregulariter angulosis, hyalinis vel pallidissime luteo-brunneolis, tenuiter tunicatis, 3—5 μ diam. metientibus composito, stomatibus innato; conidiophora subnumerosa, plus minusve divergentia recta vel parum torulosa, paulatim sed parum attenuata, majora superne minutissime denticulata, hyalina, minora continua, majora indistincte 1—2-septata, 10—30 μ, raro usque ad 43 μ longa, ad basin 3—4 μ lata; conidia bacillari-cylindracea, utrinque obtusa et saepe plus minusve attenuata, tunc subfusoidea, recta, continua, hyalina, catenulatim oriunda, 7—18 μ raro usque ad 25 μ longa, 22—3.5 μ lata.

Auf abgestorbenen Blättern von *Dichosciadium ranunculaceum*, N.S.W.: Mt. Kosciusko, 7000 ft., 29. III. 1955.

Es liegen nur ganz abgestorbene Blätter vor; mit Rücksicht auf die zwar ziemlich undeutliche, aber charakteristische Fleckenbildung kann es jedoch keinem Zweifel unterliegen, dass dieser Pilz ein typischer Blattparasit ist.

Callistospora n. gen. eine neue, phaeophragmospore Sphaeropsideengattung.

Von F. Petrak (Wien).

Callistospora Petr. n. gen.

Pycnidia dispersa, subepidermalia, globosa vel late ellipsoidea, ostiolo papilliformi, poro irregulariter rotundato punctiformiter erumpentia; pariete membranaceo, pseudoparenchymatico, olivaceo; conidia fusoidea, utrinque attenuata, plerumque arcuata vel leniter S-formiter curvula, raro fere recta, pluriseptata, loculis compluribus mediis amoene olivaceis, sursum deorsumque paulatim pallidioribus, extremis hyalinis vel subhyalinis, plus minusve truncato-conicis, loculo quodam medio rarissime septo longitudinali diviso, loculo infimo appendicula subhemisphaerica vel cuculliformi, hyalina aucto; episporio crassiusculo; conidiophora totam parietis superficiem interiorem obtegentia, brevissime cylindracea vel cylindraceo-conica, conidiis saepe diu adhaerentia.

Fruchtgehäuse zerstreut, subepidermal, rundlich oder breit ellipsoidisch, mit flachem, papillenförmigem, von einem unregelmässig rundlichen Porus durchbohrtem Ostiolum punktförmig hervorbrechend. Pyknidenmembran häutig, pseudoparenchymatisch, schwarzbraun. Konidien lang spindelförmig, beidendig ziemlich stark verjüngt, meist bogig oder schwach S-förmig gekrümmt, mit mehreren, dunkelbraunen, gegen die Enden allmählich heller werdenden mittleren und hyalinen oder subhyalinen, stumpf konischen, oft abgestutzten Endzellen, die untere mit kleinem, halbkugeligem oder kappenförmigem Anhängsel, in einer der mittleren Zellen zuweilen mit einer Längswand. Konidienträger die ganze Innenfläche der Membran überziehend, kurz zylindrisch oder konisch-zylindrisch, einfach, den Konidien oft lange anhaftend.

Callistospora Gaubae Petr. n. spec.

Pycnidia irregulariter et laxe dispersa, plerumque in series breves, longitudinales, parallelas disposita, solitaria, raro bina complurave subaggregata, subepidermalia, globosa vel late ellipsoidea, vix vel parum compressa, ostiolo crassiuscule papilliformi, poro irregulariter rotundato, ca. 25 μ lato perforato punctiformiter erumpentia, 180—330 diam.; pariete molliter membranaceo, ca. 10—15 μ crasso, contextu pseudoparenchymatico, e cellulis irregulariter angulosis,

tenuiter tunicatis, pellucide olivaceis, ca. 8—18 μ diam. metientibus composito; conidia fusoidea, utrinque attenuata, plerumque arcuata vel S-formiter curvula, raro fere recta, pluriseptata, loculis compluribus mediis amoene olivaceis, sursum deorsumque paulatim pallidioribus, extremis hyalinis vel subhyalinis, plus minusve truncato-conicis, loculo quodam medio rarissime septo longitudinali diviso, loculo infimo appendicula subhemisphaerica vel cuculliformi, hyalina aucto, episporio loculorum mediorum 2—3.5 μ crasso, extremorum paulo tenuiore, 42—65 ⇌ 10—16 μ; conidiophora totam parietis superficiem interiorem obtegentia, brevissime cylindracea vel subcvnica, 5—10 ⇌ 3—4.5 μ, conidiis saepe diu adhaerentia.

Pykniden weitläufig und unregelmässig zerstreut, oft in lockeren oder ziemlich dichten, parallelen Längsreihen wachsend und hellgraue, unterbrochene, unscharf begrenzte Verfärbungen verursachend, subepidermal sich im Mesophyll entwickelnd, rundlich oder breit ellipsoidisch, kaum oder nur schwach zusammengedrückt, selten etwas unregelmässig, 180—330 μ, meist ca. 250 μ im Durchmesser, oben fest mit der Epidermis verwachsen, nur mit dem flachen, ziemlich dick papillenförmigen, von einem unregelmässig rundlichen, ca. 25 μ weiten Porus durchbohrten Ostiolum punktförmig hervorbrechend. Pyknidenmembran ca. 10—15 μ, oben bis ca. 20 μ dick, aus mehreren, meist 3 Lagen von unregelmässig eckigen, ziemlich stark zusammengepressten, 8—15 μ, selten bis ca. 18 μ grossen, durchscheinend und oft ziemlich hell grau- oder olivbraunen, ziemlich dünnwandigen Zellen bestehend, innen plötzlich in eine dünne, hyaline, undeutlich faserig zellige Schicht übergehend, aussen sehr fest mit ganz verschrumpften Substratresten und vereinzelten, ca. 2—3.5 μ breiten, meist schon stark verschrumpften Hyphen besetzt, keine scharfe Grenze zeigend. Konidien spindelförmig, beidendig ziemlich stark und allmählich verjüngt, meist bogig oder schwach S-förmig gekrümmt, selten fast gerade, mit 6—11, meist 7—9 Querwänden, nicht oder nur sehr schwach eingeschnürt, sehr selten in einer der mittleren Zellen mit einer Längswand, 42—65 μ, meist ca. 45—55 μ lang, 10—16 μ breit, die mittleren Zellen schön und dunkel olivbraun, gegen die Enden allmählich heller werdend, die Endzellen stumpf konisch, hyalin oder subhyalin, die obere meist breit und ziemlich scharf abgestutzt, die untere mit ihrem Ende in einem fast halbkugeligen oder kappenförmigen, hyalinen Anhängsel steckend. Das Epispor der mittleren Zellen ist ca. 2—3 μ dick, wird bei den übrigen Zellen allmählich dünner und ist bei den Endzellen an den Seiten ca. 1—1.5 μ am Ende aber wieder ca. 3—5 μ dick. Konidienträger die ganze Innenfläche der Wand überziehend, sehr kurz zylindrisch oder etwas konisch, bis ca. 10 μ lang, 3—4.5 μ breit, den Konidien lange anhaftend.

Auf dürren Halmen von *Danthonia frigida;* N.S.W., Mt. Kosciusko, Australien, ca. 6000 ft., 29. III. 1955, leg. E. Gauba.

Dieser schöne, in Gesellschaft verschiedener Sphaeropsideen und Pyrenomyzeten wachsende, durch Form und Bau der Konidien sehr ausgezeichnete Pilz kann nur mit *Hendersonia* verglichen werden, unterscheidet sich aber von dieser artenreichen Gattung durch die grossen, verschieden gekrümmten, gegen die Enden allmählich heller gefärbten, mit hyalinen oder subhyalinen Endzellen und dickem Epispor versehenen Konidien. Die obere Endzelle ist stets mehr oder weniger scharf abgestutzt; die untere steckt in einem halbkugeligen oder kappenförmigen Anhängsel, das aus dem lange anhaftenden Konidienträger hervorzugehen scheint. Eine Schlauchform, die als sicher zugehörig erachtet werden könnte, ist am vorliegenden, prächtig entwickelten Material nicht vorhanden. Ich halte es aber für sehr wahrscheinlich, dass als solche eine Art der Gattung *Heptameria* in Betracht kommen dürfte.

Neue Askomyzeten und Fungi imperfecti der österreichischen Flora.

Von F. Petrak (Wien).

Didymella Ruttneri Petr. n. spec.

Perithecia irregulariter et subdense dispersa vel subgregaria, saepe bina complurave plus minusve aggregata, subepidermalia ambitu orbicularia vel late elliptica, crasse pulvinata, ostiolo papilliformi, diu clauso, denique poro irregulariter rotundato, ca. 20 μ lato perforato punctiformiter erumpentia, strato matricis tegente abjecto saepe omnino libera et quasi superficialia, 250—450 μ diam., 130—180 μ alta; loculo depresso-globoso vel lenticulari, 150—250 μ lato, 70—110 μ alto; pariete membranaceo-subcoriaceo, ad basin et in vertice ca. 30—45 μ, ad latera 60—120 μ crasso, contextu pseudoparenchymatico, e cellulis irregulariter angulosis, saepe plus minusve elongatis, extus fere opace atro-brunneis et crasse, intus tenuiter tunicatis ibique paulatim pallidioribus, quoad magnitudinem variabilibus composito; asci numerosi, cylindracei vel clavato-cylindracei, antice late rotundati, postice in stipitem brevem, nodulosum contracti vel subsessiles, crasse tunicati, 8-spori, p. sp. 65—80 ⇌ 9—11 μ; sporae plus minusve di- raro fere monostichae, oblongo-fusoideae, utrinque obtusiusculae vel subacuminatae, postice saepe magis attenuatae, tunc plus minusve clavatae, rectae vel inaequilaterae, raro curvulae, plerumque infra medium, raro fere medio septatae, non vel lenissime constrictae, hyalinae, 14—20 ⇌ 4—5 μ; paraphysoides subnumerosae, fibrosae, mox viescentes et mucosae.

Auf dürren Stengeln von *Alectorolophus* spec. im Durchlass auf Bergwiesen am Fusse des Scheiblingsteines bei Lunz in Niederösterreich, IV. 1943, leg. F. Petrak.

Diese Art gehört mit *D. pedicularidis* v. Arx dem Formenkreise der *D. eupyrena* Sacc. an. Sie unterscheidet sich von diesen Arten durch etwas grössere, stark niedergedrückte, dick polsterförmige Perithezien, die im Querschnitt einem unilokulären, dothidealen Stroma gleichen und auch als solches aufgefasst werden könnten. Die Perithezien von *D. eupyrena* sind nicht oder nur schwach, die von *D. pedicularidis* zwar etwas stärker, aber nie so stark niedergedrückt wie bei *D. Ruttneri*, auch sind die Perithezien dieser Arten an den Seiten nicht oder nur schwach, nie aber so stark verdickt wie bei *D. Ruttneri*.

Die Aussenkruste der Peritheziummembran besteht aus einer einzigen Lage von mehr oder weniger isodiametrischen, ca. 7—12 μ grossen Zellen, deren nach aussen grenzende Wände sehr stark verdickt und fast opak schwarzbraun gefärbt sind. Weiter innen sind die Zellen viel heller gefärbt, unten und oben in senkrechter Richtung oft etwas gestreckt, bis ca. 18 μ lang und 6—12 μ breit. An den Seiten sind die inneren Zellen mehr oder weniger isodiametrisch, seltener etwas gestreckt und meist ca. 16—21 μ gross. Der dicken Peritheziummembran wegen ist der Lokulus relativ klein, mehr oder weniger stark niedergedrückt rundlich oder linsenförmig. Er wird von einer ca. 6—12 μ dicken, konzentrisch faserig gebaut erscheinenden Schicht umgeben, die aus den 2—3 innersten, stark zusammengepressten Zellschichten der Membran besteht und leicht für eine besondere, gleichsam „innere" Peritheziummembran gehalten werden könnte.

Karstenula rhodothamni Petr. n. spec.

Syn.: *Pleospora rhodothamni* Petr. in sched. 1939.

Perithecia irregulariter et laxissime dispersa, plerumque solitaria, rarissime 2—3 subaggregata, depresso-globosa, subepidermalia, mox plus minusve erumpentia, 280—350 μ diam., raro etiam paulo-majora, ostiolo crassiusculo, truncato-conico, poro irregulariter anguloso, ca. 20 μ lato aperta praedita, extus imprimis ad basis marginem hyphis paucis vel subnumerosis, plus minusve radiantibus, simplicibus vel parce ramosis, remote septatis, pellucide olivaceis, 3—4 μ crassis praedita; pariete ca. 20 μ crasso, pseudoparenchymatico, e cellulis irregulariter angulosis, tenuiter tunicatis, pellucide griseo-olivaceis, ad basin interdum subhyalinis, in vertice fere opace atro-olivaceis minoribusque, 6—12 μ, raro usque ad 15 μ diam. metientibus composito; asci numerosi, cylindracei, antice late rotundati, postice in stipitem crassiusculum, nodulosum, 6—12 μ longum contracti, crasse tunicati, 8-spori, p. sp. 95—120 ⇌ 10—12 μ; sporae plus minusve oblique monostichae, oblongae vel oblongo-ellipsoideae, utrinque obtusae, antice vix vel parum, postice plerumque manifeste attenuatae, tunc late fusoideae vel clavato-oblongae, triseptatae, medio manifeste, ceterum vix vel leniter constrictae olivaceae, loculis terminalibus plus minusve dilutioribus, mediis saepe septo longitudinali praeditae, 15—21 μ, rarissime usque ad 23 μ longae, 6—8.5 μ latae; paraphyses numerosae, filiformes, simplices vel parce ramosae, ca. 1.5 μ crassae, sero mucosae.

Auf lebenden Ästchen von *Rhodothamnus chamaecistus* unterhalb der Pfeishütte im Karwendel-Gebirge bei Innsbruck in Tirol, VII. 1940, leg. F. Petrak.

Die Endzellen der Sporen sind stets heller gefärbt, die untere ist oft subhyalin. Eine Längswand ist oft in einer der mittleren Zellen, seltener in beiden vorhanden.

Leptodothiora austriaca Petr. n. spec.

Stroma late effusum, ramulos circumcirca cingens et matricis superficiem plus minusve nigrificans, nunc tenuiter crustaceum ca. 10—20 μ crassum, contextu pseudoparenchymaticum, e stratis 1—3 cellularum rotundato-angulatarum, atro-brunnearum, tenuiter tunicatarum ca. 5—12 μ diam. metientium compositum, nunc 40—70 μ crassum, tunc contextu plus minusve prosenchymatico, e cellulis verticaliter elongatis, usque ad 15 μ longis sed 5—7.5 μ tantum latis compositum; ascomata subdense vel dense dispersa, solitaria, ambitu orbicularia vel late ellipsoidea, saepe plus minusve irregularia, tympaniformia, superne plus minusve applanata vel parum convexula, cum epidermidis pariete exteriore fere clypeiformiter connata, postea centro late truncato-conico epidermidem disrumpentia sed omnino clausa, in maturitate irregulariter dilabentia, denique late, saepe fere usque ad verticis marginem aperta, 150—200 μ diam., 120—150 μ alta; pariete in iuventute membranaceo, postea subcarbonaceo, contextu in vertice manifeste prosenchymatico, ceterum pseudoparenchymatico, e cellulis irregulariter angulosis, extus atro-olivaceis, crassiuscule tunicatis, intus pallidioribus et tenuiter tunicatis, ca. 5—12 μ, raro usque ad 16 μ diam. metientibus, vix vel parum compressis composito; asci subnumerosi, plus minusve parallele positi, clavato-cylindracei, antice late rotundati, postice in stipitem crasse nodulosum, 5—12 μ longum attenuati, crasse tunicati, 8- raro 4—6-spori, p. sp. 55—68 ⇌ 13—16 μ; sporae plus minusve distichae, anguste fusoideae, utrinque plus minusve attenuatae, subobtusae, rectae verl curvulae, minores 1—3-, majores 4—7-septatae, ad septa non constrictae, hyalinae, 15—20 μ, raro usque ad 23 μ longae, 3.5—5.5 μ latae; paraphysoides paucae fere tantum supra ascos visibiles, indistincte fibroso-cellusolae, mox mucosae.

Auf abgestorbenen, noch stehenden Stocktrieben von *Staphylea pinnata*; am Hundsheimerkogel bei Hainberg in Nieder-Österreich, V. 1940, leg. F. Petrak.

Bei oberflächlicher Betrachtung ähnelt dieser Pilz, der als eine typische *Leptodothiora*-Art aufgefasst werden muss, der *Caulochora Baumgartneri*. Aber schon bei schwacher Lupenvergrösserung ist zu sehen, dass er davon durch kleinere, einem weit ausgebreiteten Stroma eingewachsene Fruchtkörper abweicht. Das intramatrikale Stroma ist meist dünn krustig, oft etwas unterbrochen und besteht nur aus 1—3 Zellschichten, kann sich an manchen Stellen auch zu prosenchymatischen Platten verdicken. In ganz jungem Zustande be-

stehen die Fruchtkörper aus einem senkrecht prosenchymatischen Gewebe, das oben eine ca. 20—30 μ dicke Deckschicht bildet. Der obere, so wie die Basis pseudoparenchymatische Seitenrand ist ringwulstartig auf ca. 40—65 μ verdickt, verjüngt sich nach aussen und geht allmählich in das sterile Stroma über. Das Innere der jungen Fruchtkörper besteht aus einem Pseudoparenchym von völlig hyalinen, relativ dick-, aber zartwandigen, inhaltsreichen, rundlich eckigen Zellen, die nach aussen ziemlich rasch in das Wandgewebe übergehen.

Ob *L. austriaca* mit *Metasphaeria staphylina* (Peck) Sacc. Syll. II. p. 167 (1883) identisch oder davon verschieden ist, könnte mit Rücksicht auf die kurze, ganz unvollständige Beschreibung nur durch Vergleich mit dem Originalexemplare P e c k's festgestellt werden.

Mycosphaerella vindobonensis Petr. n. spec.

Perithecia irregulariter laxe vel subdense dispersa, solitaria vel bina complurave subaggregata, subepidermalia, globosa vel late ellipsoidea, interdum plus minusve irregularia, 65—100 μ diam., ostiolo papilliformi, poro irregulariter rotundato ca. 12 μ lato perforato punctiformiter erumpentia, extus imprimis ad verticis marginem hyphis nonnullis, parce ramosis, breviter articulatis, pallide olivaceis vel melleis, 4—8 μ crassis praedita; pariete ca. 10 μ crasso, contextu pseudoparenchymatico, e cellulis e basi apicem versus plus minusve in series parallelas ordinatis, pellucide atro-brunneis, 5—10 μ, raro usque ad 16 μ longis, 4—6 μ latis, tenuiter tunicatis composito; asci subnumerosi, obclavati, antice late rotundati, postice plus minusve saccati, subsessiles, crasse tunicati, 26—35 ⇌ 9—11 μ; sporae bi- vel indistincte tristichae, oblongo-clavatae, utrinque obtusae, postice paulatim attennuatae, rectae, raro curvulae, medio septatae, non vel lenissime constrictae, hyalinae, plasmate laxe granuloso, interdum etiam guttulis oleosis minutulis 1—2 praeditae, 9—12 ⇌ 3—4 μ; paraphysoides paucae, indistincte fibroso-cellusolae, mox omnino mucosae.

Auf dürren Stengeln von *Globularia Willkommii;* Wien: am Bisamberge bei Langenzersdorf, VI. 1940, leg. F. P e t r a k.

Zu der *Mycosphaerella* gehört als Nebenfruchtform eine ganz alte *Septoria*, in deren Pykniden nur noch einzelne, kurzfädige, meist gerade, ca. 20 ⇌ 1.5 μ grosse Konidien verhanden sind.

Wettsteinina carinthiaca Petr. n. spec.

Stroma fibrosum, nervos sequens, tunc irregulariter dendritice ramosum, fibris arte limitatis, ca. 15—65 μ crassis, ex hyphis parallelis articulatis, ca. 3—6 μ crassis, atro-brunneis, arte connatis compositum; perithecia laxe dispersa, solitaria, raro bina subaggregata,

in fibris stromaticis oriunda, plus minusve globosa vel late ellipsoidea, 180—250 μ raro usque ad 300 μ diam., omnino clausa, in maturitate probabiliter e verticis centro dilabentia; pariete ca. 20 μ crasso, membranaceo-subcarbonaceo, contextu pseudoparenchymatico, e cellulis irregulariter angulosis, atro-olivaceis, saepe fere opacis, vix compressis, crassiuscule tunicatis, 6—10 μ raro usque ad 13 μ diam. metientibus, intus minoribus, tenuiter tunicatis, pallidioribus et in contextum loculi paraphysoideum transeuntibus compositio; asci pauci, plerumque 6—9 in quoque perithecio, crasse clavati, antice late rotundati, postice plus minusve attenuati, subsessiles, crasse tunicati, 8-spori, ca. 110—135 × 35—43 μ; sporae di- vel incomplete tristichae, oblongo-fusoideae, utrinque obtusae et plus minusve attenuatae, rectae, inaequilaterae vel curvulae, 10—13-septatae, non constrictae, praematurae septo longitudinali incompleto divisae, diu hyalinae, episporio ca. 1.5—2 μ crasso, muco hyalino ca. 3.5 μ crasso obvolutae, denique olivaceae, 40—63 × 17—21 μ; paraphysoides subnumerosae, fibrosae, breviter articulatae, mox viescentes et mucosae.

Auf abgestorbenen, vorjährigen Blättern von *Ranunculus alpestris* am Steinschober der Koralpe in Kärnten, 21. VII. 1909, leg. K. **Ronniger.**

Auf dem mir vorliegenden Material ist eine Form von *M. allicina* (Fr.) Vesterg. reichlich, der oben beschriebene, sehr eigenartige Pilz jedoch nur sehr spärlich und fast nur in jungem Entwicklungszustande vorhanden. Nur drei reife Sporen, die aus älteren Perithezien ausgetreten waren, konnten gefunden werden. Vom *Wettsteinina*-Typus weicht der Pilz durch das eigenartige, strangförmige, den Nerven folgende, sich deshalb locker dendritisch verzweigende Stroma und durch die schon frühzeitig mit zahlreichen Quer- und einer unvollständigen Längswand versehenen Sporen ab. Deshalb muss er als Typus einer neuen Untergattung aufgefasst werden, die auf folgende Weise zu charakterisieren wäre:

Wettsteinina v. Höhn. subgen. **Wettsteiniella** Petr. n. subgen.

Stroma fibrosum, nervos sequens, indidem irregulariter dendritice ramosum, fibris arte limitatis, ex hyphis parallelis articulatis, atro-brunneis compositum; perithecia a latere stromatis fibrarum vel in eis oriunda, omnino clausa, in maturitate probabiliter e verticis centro dilabentia; sporae oblongo-fusoideae, iam praematurae multiseptatae et septo incomplete longitudinali divisae, diu hyalinae, denique obscure olivaceae.

Ascochyta Baumgartneri Petr. n. spec.

Maculae amphigenae, laxe et irregulariter dispersae, plerumque accurate obriculares, ca. 1—5 mm diam., raro 2—3 aggegatae et plus

minusve confluentes, primo obscure brunneae, postea griseae, denique albidae, linea obscuriore elevata arte limitatae, plerumque steriles; pycnidia epiphylla, singularia vel pauca in quaque macula, subepidermalia vel fere intraepidermalia, globosa, plus minusve depressa, 70—100 μ diam., ostiolo truncato-conico vel fere cylindraceo, poro rotundato perforato punctiformiter erumpentia; pariete flavobrunneolo, circa porum obscure olivaceo, indistincte celluloso, extus cum matricis reliquiis vietis arte connato; conidia anguste cylindracea, utrinque obtusa, saepe fere truncata nec attenuata, plerumque curvula, raro recta, medio pseudoseptata, hyalina, 6—11 ⇌ 2—3 μ; conidiophora iam omnino mucosa, inconspicua.

Auf lebenden Blättern von *Taraxacum serotinum*; auf Wiesen bei Schwechat nächst Wien, IX. 1940, leg. J. Baumgartner.

Pykniden dieser, ihrem Entdecker, dem bekannten, kürzlich verstorbenen Bryologen, Hofrat J. Baumgartner zu Ehren benannten Art sind nur in wenigen Flecken vorhanden und scheinen auch ihre volle Reife noch nicht erlangt zu haben. Reife Sporen dürften vielleicht die oben angegebenen Grössen noch etwas überschreiten.

Ceuthospora chamaebuxi Petr. n. spec.

Stromata amphigena, irregulariter et laxe dispersa, solitaria vel bina complurave subaggregata, late truncato-conica, ad basin 350—500 μ diam., inferne vix, superne bene evoluta, contextu pseudoparenchymatico vel indistincte prosenchymatico, e cellulis irregulariter angulosis, ca. 5—10 μ, raro usque ad 13 μ diam. metientibus, tenuiter tunicatis, pellucide olivaceis composito; pycnidia plerumque 3—6, valsoideo-monosticha, plus minusve aggregata, inter se libera vel parum connata, globosa vel ovoidea, 130—180 μ diam., ostiolis cylindraceo-conicis in stromatis superficie punctiformiter erumpentia; pariete gelatinoso-carnoso, ca. 15—30 μ crasso, contextu pseudoparenchymatico, e cellulis extus pallide olivaceis vel flavobrunneolis, intus hyalinis, crassiuscule tunicatis, plus minusve compressis, 4—7 μ, raro usque ad 10 μ diam. metientibus composito; conidia numerosissima, cylindraceo-bacillaria, utrinque obtusa, non vel postice tantum lenissime attenuata, recta, continua, hyalina, 5—10 ⇌ 1.5—2 μ; conidiophora iam omnino mucosa.

Auf dürren Blättern von *Polygala chamaebuxus*; Waldränder am Durchlass bei Seehof nächst Lunz in Nieder-Österreich, V. 1943, leg. F. Petrak.

Von anderen Arten der Gattung ist der oben beschriebene Pilz durch die kleinen Konidien leicht zu unterscheiden.

Coleophoma soldanellae Petr. n. spec.

Pycnidia, ut videtur, semper epiphylla, irregulariter laxe vel subdense dispersa, non raro 2—3 aggregata, tunc plus minusve, saepe fere omnino connata, in epidermide evoluta, ambitu orbicularia vel late elliptica, plus minusve pulvinata, 120—200 μ diam., superne usque ad marginem cum epidermidis pariete exteriore omnino connata, poro centrali, irregulariter rotundato vel elliptico, ca. 30—40 μ lato aperta; strato basali ca. 15—20 μ crasso, contextu indistincte pseudoparenchymatico, e cellulis irregulariter globosis, 4—6 μ diam. metientibus, atro-brunneis composito, superne conidiophoris tenuiter filiformibus, simplicibus, 3—4 μ longis, ca. 1 μ crassis obtecto; strato tegente ca. 5—6 μ crasso, e cellulis rotundato-angulosis, pro ratione crasse tunicatis, nunc pallide melleis vel flavo-brunneis, nunc plus minusve obscure olivaceis, 3.5—6 μ diam. metientibus composito; conidia cylindraceo-bacillaria, recta, rarissime curvula, utrinque obtusa, nec attenuata, continua, hyalina, 14—18 μ, raro usque ad 20 μ longa, 2.5 μ lata.

Auf abgestorbenen Blätter von *Soldanella* spec.; am Schneeberge bei Puchberg in Nieder-Österreich, VIII 1953, leg. F. Petrak.

Diese schöne Art entspricht der Untergattung *Coleophomella,* unterscheidet sich aber vom Typus durch die am Scheitel kaum oder nur schwach konkav eingesunkenen, sich schon frühzeitig durch einen relativ weiten Porus öffnenden Fruchtkörper.

Coniothyrium pulsatillarum Petr. n. spec.

Pycnidia solitaria vel laxissime dispersa, raro bina complurave plus minusve aggregata vel fere seriatim disposita, subepidermalia, depresso-globosa vel late ellipsoidea, ca. 150—200 μ diam., raro etiam paulo majora, ostiolo plano, papilliformi, poro rotundato, arte limitato, ca. 17—23 μ lato perforato epidermidem pustulatim elevatam punctiformiter perforantia; pariete membranaceo, contextu pseudoparenchymatico, e cellulis irregulariter angulosis, tenuiter tunicatis, vix vel parum compressis, pellucide olivaceis vel obscure melleis, 6—13 μ diam. metientibus composito, extus imprimis ad verticis marginem hyphis mycelii pallide griseo-brunneolis, subremote septatis, plus minusve ramulosis et undulato-curvatis, ca. 3—6 μ latis obtecto; conidia numerosissima, mucoso-conglutinata, oblonga vel ellipsoideo-oblonga, majora saepe breviter cylindracea, utrinque obtusa, non vel indistincte attenuata, recta vel inaequilatera, continua, pallide mellea, guttula oleosa majuscula, plus minusve centrali praedita, 5—9 ⇌ 3—4.5 μ, in conidiophoris brevissimis papilliformibus ca. 3 μ longis oriunda.

Auf dürren Blättern und Blattstielen von *Pulsatilla* spec.; am Eichkogel bei Mödling in Nieder-Österreich, VII. 1955, leg. A. Patzak.

Diese schöne Form wächst in Gesellschaft einer unreifen *Pleospora* und der weiter unten beschriebenen *Hendersonia pulsatillarum*.

Hendersonia pulsatillarum Petr. n. spec.

Pycnidia solitaria vel laxissime dispersa, subepidermalia, depresso-globosa vel late ellipsoidea, ostiolo plano, papilliformi vel obtuse conico, saepe indistincto, poro irregulariter anguloso, ca. 30 μ lato, saepe longitudinaliter elongato, tunc usque ad 60 μ longo, 15—23 μ lato aperta, 250—350 μ diam.; pariete membranaceo, contextu pseudoparenchymatico, e cellulis irregulariter polyedricis, tenuiter tunicatis, pellucide olivaceis, in vertice obscure atro-brunneis minoribusque, ca. 6—10 μ diam. metientibus composito; conidia numerosissima, fusoidea, utrinque obtusa, plus minusve, raro vix vel postice tantum attenuata, tunc fere cylindracea vel clavata, recta, inaequilatera vel leniter curvula, minora continua vel 1-2-, majora 3-raro 4-septata, non constricta, obscure mellea vel pallide olivacea, 13.5—18 μ raro usque ad 20 μ longa, 3—4.5 μ lata; conidiophora totam parietis superficiem interiorem obtegentia, brevissime bacillari-subulata, apicem versus leniter sed plerumque distincte attenuata, 5—9 μ longa, 1—1.5 μ lata.

Auf abgestorbenen, vorjährigen Blättern von *Pulsatilla* spec.; am Eichkogel bei Mödling in Nieder-Österreich, VII. 1955, leg. A. Patzak.

Diese, durch relativ kleine, schmal spindelige, selten keulige oder fast zylindrische, honiggelbe Konidien ausgezeichnete Art wächst sehr spärlich zwischen Pykniden des *Coniothyrium pulsatillarum* und jungen Perithezien einer *Pleospora*.

Phoma gentianae-punctatae Petr. n. spec.

Maculae amphigenae, irregulariter et laxe dispersae, pallide alutaceae, saepe indistincte concentrice zonatae, linea tenui, elevata manifeste limitatae, orbiculares vel late ellipsoideae, interdum sinuosae et lobulatae, tunc omnino irregulares, 2—10 mm diam., confluendo etiam majores; pycnidia epiphylla, raro etiam hypophylla, subdense dispersa, saepe circulos concentricos formantia, subepidermalia, globosa, non vel parum depressa, 70—150 μ diam., interdum etiam paulo majora, ostiolo conico, interdum subelongato, tunc plus minusve cylindraceo et saepe obliquo, 40—60 μ longo, 30—35 μ crasso, poro rotundato ca. 15 μ lato perforato punctiformiter erumpentia; pariete 6—12 μ crasso, membranaceo, contextu pseudoparenchymatico, 1—3-stratoso, e cellulis irregulariter angulosis, 6—14 μ longis, 5—10 μ latis, inferne flavescentibus, pallide brunneis vel subhyalinis, sursum paulatim obscurioribus, in centro verticis fere opace atro-brunneis et paulo minoribus, ad latera saepe in series parallelas, verticaliter ascendentes disposita; conidia numerosissima, mucoso-conglutinata, bacillaria,

utrinque obtusa nec attenuata, recta, rarissime curvula, hyalina, continua, guttulis oleosis minutissimis plerumque 2 praedita, 3—4 ⇌ 1 μ, in cellulis plus minusve globosis vel ellipsoideis, 5—10 μ diam. metientibus, initio loculum omnino complentibus, in maturitate paulatim diffluentibus oriunda.

Auf lebenden Blättern von *Gentiana cruciata*; Bergwiesen bei Seehof nächst Lunz in Nieder-Österreich, IX. 1943, leg. F. Petrak.

Auf den Blättern ist auch *Puccinia gentianae* (Str.) Link reichlich und oft in denselben Flecken vorhanden, an deren Entstehung vielleicht beide Pilze beteiligt sind. Sehr charakteristisch ist die Entstehung der Konidien, die auf den Zellen eines lockeren, hyalinen, sich zentrifugal allmählich schleimig auflösenden Binnengewebes entstehen. Von den auf *Gentiana* beschriebenen *Phoma*- und *Phyllosticta*-Arten dürfte *Phoma drobnjacensis* Bub. in Bot. Közl. 1915 p. (63) dem hier beschriebenen Pilze nahe stehen, aber durch etwas grössere, vor allem längere Konidien verschieden sein.

Plenodomus Ruttneri Petr. n. spec.

Pycnidia laxe vel subdense dispersa, cum peritheciis fungi ascophori permixta, subepidermalia, depresso-globosa vel late ellipsoidea, ostiolo plano, papilliformi vel truncato-conico, poro rotundato, ca. 30 μ lato perforato punctiformiter erumpentia, postea strato matricis tegente abjecto saepe omnino libera et quasi superficialia, 250—350 μ diam., raro parum majora; pariete membranaceo-subcoriaceo, ca. 25—30 μ, ad latera usque ad 70 μ crasso, contextu pseudoparenchymatico, e cellulis irregulariter angulosis, ca. 5—16 μ diam. metientibus, extus fere opace atro-brunneis, crassiuscule tunicatis, intus pallidioribus et tenuiter tunicatis composito; conidia mucoso-conglutinata, bacillaria, utrinque obtusa nec attenuata, recta, raro curvula, continua, hyalina, 5—7 ⇌ 1.5 μ, in cellulis superficiei parietis interioris oriunda.

Auf dürren Stengeln von *Alectorolophus* sp.; im Durchlass am Fusse des Scheiblingssteines bei Lunz in Nied.-Österreich, VI. 1943, leg. F. Petrak.

Die meist schon ganz alten oder überreifen Pykniden des oben beschriebenen Pilzes wachsen stets in Gesellschaft von *Didymella Ruttneri*, oft auch zwischen Perithezien von *Leptosphaeria ogilviensis* (B. et Br.) Ces. de Not. und *Metasphaeria affinis* (Karst.) Sacc. In bezug auf den Bau der Membran stimmt *Pl. Ruttneri* mit der oben beschriebenen *Didymella* so vollständig überein, dass an der Zusammengehörigkeit der beiden Pilze nicht gezweifelt werden kann. Sie wurden Herrn Prof. Dr. F. Ruttner, Direktor der Biol. Station in Seehof bei Lunz, zu Ehren benannt.

Pseudodiplodia hierochloes Petr. n. spec.

Pycnidia irregulariter et laxe dispersa, non raro secus folii nervos seriatim disposita 120—200 μ diam., raro etiam paulo majora, globosa vel late ellipsoidea, plus minusve depressa, ostiolo minuto, papilliformi, poro rotundato-anguloso perforato punctiformiter erumpentia; pariete membranaceo, contextu pseudoparenchymatico, e cellulis, rotundato-angulosis, tenuiter tunicatis, pellucide atro-brunneis, vix vel parum compressis, 10—20 μ diam. metientibus composito; conidia numerosa, fusoidea, utrinque obtusa et plus minusve attenuata, recta vel inaequilatera, raro curvula, medio 1-septata, leniter sed plerumque manifeste constricta, in quoque loculo saepe guttula oleosa, minuscula et plasmate laxe granuloso praedita, mellea vel pallide olivacea, 15—20 ⇌ 3.5—6 μ; conidiophora iam omnino mucosa, nec conspicua, probabiliter breviter filiformi-cylindracea.

Auf dürren Blättern von *Hierochloe australis*; lichte Wälder am Galitzinberge bei Wien, 2. VI. 1939, leg. F. Petrak.

Diese Art wächst in Gesellschaft einer schlecht entwickelten Pleosporacee. Sie ist durch die weichhäutige, schwarzbraune, grosszellige Membran und durch die relativ grossen Konidien sehr ausgezeichnet und leicht kenntlich.

Pseudodiplodia Patzakii Petr. n. spec.

Pycnidia solitaria, raro 2—3 aggregata, subepidermalia, depresso-globosa vel late ellipsoidea, ostiolo obtuse conico, saepe fere truncato, diu clauso, postea poro irregulariter rotundato, indistincte limitato, 10—15 μ lato aperto epidermidem pustulatim elevatam punctiformiter perforantia sed vix prominula, 250—350 μ diam., interdum etiam paulo majora; pariete membranaceo, ca. 12—18 μ crasso, contextu amoene pseudoparenchymatico, e cellulis irregulariter rotundato-angulosis, 4—10 μ, raro usque ad 13 μ diam. metientibus, pro ratione crassiuscule tunicatis, obscure olivaceis vel atro-brunneis, intus plus minusve pallidioribus minoribusque vix vel parum compressis composito; extus hyphis mycelii nonnullis plus minusve curvatis, simplicibus vel ramosis, indistincte septatis, pallide griseo-brunneis vel fumosis, 4—6.5 μ crassis obtecta; conidia numerosissima, mucoso-conglutinata, fusoideo-oblonga vel oblongo-clavata, raro anguste ellipsoidea, utrinque obtusa et plus minusve, raro vix vel postice tantum attenuata, recta vel inaequilatera, raro curvula, medio septata, non constricta, in quaque cellula plerumque guttula oleosa, majuscula centrali praedita, obscure fumosa vel griseo-brunnea, 6—11.5 ⇌ 3—4.5 μ, in cellulis parietis superficiei interioris papilliformibus oriunda.

Auf dürren, vorjährigen Blättern und Blattstielen von *Pulsatilla* spec.; am Eichkogel bei Mödling, VII. 1955, leg. A. Patzak.

Diese schöne, durch die meist länglich-spindelige Form der ziemlich dunkel graubraunen Konidien ausgezeichnete Art wurde ihrem Sammler, Herrn Dr. A. P a t z a k, zu Ehren benannt. Sie wächst in Gesellschaft einer phomoiden Sphaeropsidee und einer unreifen Pleosporacee.

Selenophoma buphthalmi Petr. n. spec.

Maculae nunc fere in epiphyllo tantum conspicuae, indistincte limitatae, minusculae, ca. 0.5—2 mm diam. metientes, pallide brunneae, tunc potius decolorationes nominandae, nunc amphigenae, plerumque e folii apice vel e margine oriundae, paulatim acrescentes et saepe magnam vel maximam folii partem occupantes, obscure brunneae; pycnidia, ut videtur semper epiphylla, in et sub epidermide evoluta, depresso-globosa vel ellipsoidea, saepe plus minusve irregularia, 60—110 μ diam. omnino clausa, in maturitate irregulariter dilabentia et late aperta; pariete ca. 5 μ crasso, contextu superne pseudoparenchymatico, e cellulis irregulariter angulosis, tenuiter tunicatis, ca. 5—10 μ diam. metientibus, atro-brunneis composito, ad basin subhyalino vel pallide brunneolo, indistincte fibroso-celluloso; conidia pauca, quoad formam variabilia, plerumque semilunata, interdum subfusoidea vel clavata, utrinque plus minusve attenuata, subacuminata vel obtusiuscula, inaequilatera vel curvula, continua, hyalina, 9—14 ⇌ 3.5—5 μ, ad pycnidii basin tantum in cellulis hyalinis papilliformibus vel breviter conicis oriunda.

Auf lebenden Blättern von *Buphthalmum salicifolium*; Bergwiesen bei Lunz in Nied.-Österreich, IX. 1943, leg. F. P e t r a k.

Gehört sehr wahrscheinlich als Nebenfruchtform zu *Discosphaerina franconica* Petr., die ich in Ber. Bayer. Bot. Ges. XXIII. p. 170 (1938) ausführlich beschrieben habe.

Plagiophiale n. gen., eine neue Gattung der sphaerialen Askomyzeten.

Von F. Petrak (Wien).

Auf drei sehr kleinen Fragmenten stark verfaulter, vorjähriger Blätter von *Polygonum viviparum* habe ich am Steinzenkogel im Dürrensteingebiete bei Lunz in Nied.-Österreich einen eigenartigen Pilz gefunden, dessen Identifizierung mit irgend einer bereits bekannten Art mir bei der Bearbeitung der von mir bei Lunz gesammelten Pilze [Annal. Mycol. XXXVIII, p. 121—180 (1940)] nicht gelingen wollte. Weil nur sehr dürftiges, wenn auch prächtig entwickeltes Material vorlag, habe ich den Pilz damals unberücksichtigt gelassen. Mit der Bestimmung einer *Mycosphaerella* auf *Polygonum viviparum* beschäftigt, habe ich kürzlich die Diagnosen der drei für die genannte Nährpflanze angegebenen *Mycosphaerella*-Arten, *Sphaerella eucarpa* Karst., *Sph. polygonorum* (Crié) Sacc. und *M. vivipari* Wint. verglichen, die erwähnte *Mycosphaerella* mit *M. vivipari* (Karst.) identifizieren und gleichzeitig feststellen können, dass der von mir im Dürrensteingebiete gesammelte Pilz die *Sphaerella eucarpa* Karst. sein muss. Nach der Beschreibung in Saccardo's Syll. Fung. I. p. 512 (1882) soll dieser Pilz ca. 150 μ grosse Gehäuse, 120—140 μ lange, 45—55 μ breite Aszi und 32—40 ⇌ 13—14 μ grosse Sporen haben. Dass dieser Pilz keine *Mycosphaerella* sein kann, ist klar. Mit ihm ist aber auch die von mir im Dürrenstein gefundene Kollektion identisch. Die um 90° gewendeten, ganz auf der Seite liegenden Perithezien sind einer liegenden, weitbauchigen Flasche mit schief oder fast senkrecht aufwärts gebogenem Halse sehr ähnlich. Der Pilz muss als Typus einer neuen Gattung aufgefasst werden, die mit Rücksicht auf die eigenartige Form der Perithezien *Plagiophiale* heissen und hier ausführlich beschrieben werden soll.

Plagiophiale Petr. n. gen.

Perithecia dispersa omnino innata, horizontaliter procumbentia, late ellipsoidea vel ovoidea, ostiolo obliquo vel fere verticaliter curvato, subelongato, late rotundato vel fere truncato punctiformiter erumpentia; pariete membranaceo, pseudoparenchymatico, atrobrunneo; asci pauci, oblongo-ovoidei, ellipsoidei vel crasse clavati, subsessiles, mox diffluentes, 8-spori; sporae oblongo-ellipsoideae, subfusoideae vel oblongo-clavatae, plerumque rectae, circa medium

septatae, hyalinae, episporio crassiusculo, utrinque appendicula mucoso-gelatinosa, hemisphaerica vel cuculliformi aucta; paraphyses paucae iam valde mucosae, indistincte fibrosae.

Perithezien unregelmäsisg und locker zerstreut, sich im Mesophyll entwickelnd, um 90° gewendet, auf der Seite liegend, breit ellipsoidisch oder eiförmig, mit schief, oft fast senkrecht aufsteigendem, etwas halsartig verlängertem, ziemlich dickem, kaum oder nur wenig vorragendem Ostiolum. Piritheziummembran häutig, pseudoparenchymatisch, schwarzbraun. Aszi in geringer Zahl, sehr gross, länglich eiförmig, ellipsoidisch oder dick keulig, fast sitzend, sehr leicht zerfliessend, 8-sporig; Sporen sehr gross, 44 ⇌ 13, länglich ellipsoidisch, oft etwas spindelig oder keulig, meist gerade, ungefähr in der Mitte septiert, hyalin, mit deutlich sichtbarem Epispor, an den Enden mit kleinen, schleimig-gelatinösen, flach halbkugeligen oder kappenförmigen, später zerfliessenden Anhängseln versehen. Paraphysen ziemlich spärlich, ganz verschrumpft und verschleimt eine faserige, undeutlich feinkörnige Masse bildend.

Plagiophiale eucarpa (Karst.) Petr. n. comb.

Syn.: *Sphaerella eucarpa* Karst. Öfvers. Svensk Vetensk. Akad. Förh. 1872, Nr. 2, p. 103.

Perithezien unregelmässig und locker zerstreut, meist ganz vereinzelt, selten zu 2—3 etwas dichter beisammenstehend, subepidermal eingewachsen, horizontal liegend, einer weitbauchigen Flasche mit schief aufwärts gerichtetem Halse sehr ähnlich, ellipsoidisch oder eiförmig, beiderseits pustelförmig vorgewölbt, 250—350 μ lang, 200—300 μ dick, mit halsartig verlängertem, schief oder fast vertikal aufwärts gerichtetem, zylindrischem, punktförmig hervorbrechendem, kaum oder nur wenig vorragendem, ca. 100 μ dickem, mit aufwärts gerichteten derbfädigen Periphysen ausgefülltem, sich durch einen rundlichen, ca. 35—40 μ weiten Porus öffnendem Ostiolum. Wand häutig, ca. 12—20 μ dick, aus mehreren Lagen von unregelmässig eckigen, ziemlich dünnwandigen, schwarzbaunen, mehr oder weniger zusammengepressten, innen heller gefärbten, in eine dünne, konzentrisch faserige Schicht übergehenden, ca. 6—15 μ grossen, zuweilen etwas gestreckten, dann bis ca. 20 μ langen Zellen bestehend, aussen fest mit ganz verschrumpften Substratresten verwachsen und mit einzelnen, kurzen, olivbraunen, septierten, ca. 2.5—6 μ dicken, meist stark gekrümmten Hyphen besetzt; Aszi in geringer Zahl, selten mehr als 10, länglich eiförmig oder ellipsoidisch, dick keulig, oben sehr breit abgerundet, unten mehr oder weniger verjüngt oder plötzlich zusammengezogen, fast sitzend oder sehr kurz und sehr dick knopfig gestielt, leicht zerfliessend, 8-sporig, 115—150 ⇌ 30—55 μ; Sporen zwei- oder unvollständig dreireihig, länglich

ellipsoidisch, beidendig abgerundet, kaum oder schwach unten oft stärker verjüngt, dann etwas spindelig oder keulig, gerade, selten ungleichseitig oder sehr schwach gekrümmt, ungefähr in der Mitte septiert, kaum oder sehr schwach eingeschnürt, hyalin, mit homogenem, ziemlich grobkörnigem Plasma und deutlich sichtbarem, ca. 1.5 μ dickem Epispor, 38—50 ⇌ 11—15 μ, meist ca. 40—45 μ lang, an jedem Ende ein flach halbkugeliges oder kappenförmiges, gelatinöses, bald verschleimendes Anhängsel tragend; Paraphysen spärlich, schon stark verschrumpft und verschleimt, aus einer faserigen, unregelmässig körnigen Masse bestehend.

Die Gattung *Plagiophiale* nimmt offenbar eine sehr isolierte Stellung ein. Mit *Plagiostoma* Fuck., einer typischen Gnomonieen-Gattung mit sehr zahlreichen Schläuchen und kleinen, dünnwandigen Sporen ist sie gewiss nicht näher verwandt. *Plagiostigme* Syd., deren Typusart an den Sporen ähnliche Anhängsel hat, ist durch die nur etwas schiefen, nicht horizontal liegenden Perithezien und durch die nahe dem unteren Ende septierten Sporen von *Plagiophiale* wesentlich verschieden.

Coccogloeum n. gen., eine neue Gattung der gloeosporoiden Melanconieen.

Von F. Petrak (Wien).

Coccogloeum Petr. n. gen.

Acervuli dispersi, plerumque series longitudinales formantes, longitudinaliter plus minusve protracti, ambitu anguste ellipsoidei vel striiformes, intraepidermales, primo pariete epidermidis exteriore, plus minusve pustulatim elevato tecti, eo disrupto irregulariter aperti; stroma intramatricale mesophylli cellulis innatum, contextu pseudoparenchymatico, subhyalino vel pallidissime flavo-brunneolo; strato basali fere aequali crassitudine, contextu hyalino, inferne minutissime pseudoparenchymatico, superne prosenchymatico; conidia numerosissima, mucoso-conglutinata, minutissima, late ellipsoidea vel ovoidea, interdum plus minusve globosa, continua, hyalina, in strati basalis superficie iterum iterumque oriunda.

Fruchtkörper zerstreut, meist in Längsreihen hintereinanderstehend, in der Längsrichtung mehr oder weniger, oft ziemlich stark gestreckt, im Umriss schmal elliptisch oder kurz streifenförmig, sich in der Epidermis aus einem intramatrikalen, die Zellen des Mesophylls mehr oder weniger, zuweilen fast ganz ausfüllenden, pseudoparenchymatischen, subhyalinen Stroma entwickelnd, aus einer ganz flachen, ziemlich dünnen, der Epidermisinnenwand fest aufgewachsenen, oben nur von der flach pustelförmig vorgewölbten Epidermisaussenwand bedeckten, hyalinen, unten pseudoparenchymatischen aus fast isodiametrischen, weiter oben etwas gestreckten Zellen bestehenden, in ein senkrechtes, inhaltsreiches Prosenchym übergehenden Basalschicht bestehend. Konidien massenhaft, stark schleimig verklebt, breit ellipsoidisch oder eiförmig, zuweilen fast kugelig, hyalin, einzellig, sehr klein, in rascher Folge auf der Innenfläche der Basalschicht entstehend.

Coccogloeum microsporum Petr. n. spec.

Acervuli amphigeni, irregulariter et laxe dispersi, saepe in series longitudinales ordinati, intraepidermales, longitudinaliter plus minusve, saepe valde protracti, ambitu anguste ellipsoidei vel breviter striiformes, ca. 400—1500 μ longi, 150—500 μ lati, primo pariete epidermidis exteriore plus minusve pustulatim elevato tecti, in maturitate eo disrupto plus minusve denudati; stromate intramatricali in

mesophyllo evoluto, eius cellulas plus minusve, saepe omnino complente, contextu pseudoparenchymatico, e cellulis rotundato-angulosis, hyalinis vel subhyalinis, 3—6 μ, raro usque ad 10 μ diam. metientibus composito; strato basali pariete epidermidis interiori adnato, contextu hyalino, inferne minutissime pseudoparenchymatico, superne tenuiter prosenchymatico; conidia numerosissima, mucoso-conglutinata, minutissima, coccis bacterioideis simillima, late ellipsoidea vel ovoidea, utrinque obtusa, recta, non raro plus minusve globosa, hyalina, continua, 1.5—2.5 μ raro ad 3 μ longa, 1—2 μ lata in strati basalis superficie interiore iterum iterumque oriunda.

Fruchtkörper unregelmässig locker zerstreut, meist in kurzen, lockeren oder ziemlich dichten, parallelen Längsreihen wachsend, auf beiden Blattseiten, sich in der Epidermis entwickelnd, in der Längsrichtung des Substrates mehr oder weniger gestreckt, im Umriss schmal elliptisch oder kurz streifenförmig, an den Enden mehr oder weniger breit abgerundet, kaum oder schwach, oft auch stärker verjüngt und stumpf zugespitzt, 500—1000 μ, selten bis ca. 1500 μ lang, 150—500 μ breit. Im Mesophyll entwickelt sich ein pseudoparenchymatisches Stroma, das die Zellen der Matrix mehr oder weniger, meist vollständig ausfüllt und aus rundlich eckigen, mehr oder weniger isodiametrischen, hyalinen oder subhyalinen, in dickeren Schichten sehr hell gelbbräunlich gefärbt erscheinenden, 4—8 μ, selten bis ca. 10 μ grossen, ziemlich dünnwandigen Zellen besteht. In den zwischen den Zellen des Mesophylls zuweilen entstehenden Hohlräumen sind oft äusserst zartwandige, einfache oder sehr locker verzweigte, spärliches, sehr feinkörniges Plasma und einzelne, sehr kleine Öltröpfchen enthaltende, hyaline, sehr undeutlich und ziemlich entfernt septierte Myzelhyphen vorhanden. Solche Hyphen dringen oben in die Epidermis ein und entwickeln dort die vollkommen flache, der Epidermisinnenwand aufgewachsene Basalschicht, die ca. 13—15 μ dick ist und aus zwei voneinander nicht scharf getrennten Schichten besteht. Von diesen ist die untere 5—8 μ, selten bis 10 μ dick und besteht aus einem pseudoparenchymatischen Gewebe von rundlich-eckigen, verhältnismässig dickwandigen, mehr oder weniger isodiametrischen, hyalinen, ca. 1.5—3 μ grossen Zellen. Die obere Schicht ist ca. 8—12 μ dick, deutlich senkrecht prosenchymatisch und besteht aus inhaltsreicheren, in senkrechter Richtung meist deutlich gestreckten, wohl auch etwas zartwandigeren Zellen. Durch die in ungeheuren Mengen entstehenden Konidien wird die, den anfangs ganz flachen Konidienraum bedeckende Epidermis pustelförmig vorgewölbt. Bei der Reife reisst sie ganz unregelmässig auf, so dass die subhyalinen Konidienmassen austreten können, die nach dem Eintrocknen als dünne, ziemlich spröde, hell gelbbräunliche, etwas glänzende Krusten die Blattfläche bedecken.

Die in ungeheuren Mengen gebildeten, kokkenartigen Konidien sind ziemlich stark schleimig verklebt, breit ellipsoidisch oder eiförmig, zuweilen fast kugelig, gerade, einzellig, hyalin, 1.5—2.5 µ, selten bis 3 µ lang, 1—2 µ breit und entstehen in schneller Folge auf der inneren Fläche der Basalschicht.

Auf abgestorbenen Nadeln von *Picea pungens* in den Baumschulen Visser-Nosicka bei Pressbaum im Wienerwalde. 10. VII. 1955.

Das der hier mitgeteilten Beschreibung zugrunde liegende Material wurde von der genannten Baumschule an die Abteilung Forstschutz der Forstlichen Bundes-Versuchsanstalt Mariabrunn eingesendet und mir von dort zur Untersuchung übergeben. Der eigenartige, durch verschiedene Merkmale sehr ausgezeichnete Pilz ist typisch gloeosporoid gebaut und dürfte wahrscheinlich die Nebenfruchtform eines Diskomyzeten sein. Er befällt meist alle Nadeln der vorjährigen Triebe, die er bald zum Absterben bringt. Seine Entwicklung scheint durch anhaltend feuchtes, kühleres Wetter sehr begünstigt zu werden.

Von anderen gloeosporoiden Gattungen ist *Coccogloeum* sofort und sehr leicht durch den charakteristischen Bau des intramatrikalen Stromas und der Basalschicht, ganz besonders aber durch die in ungeheuren Mengen gebildeten, stark schleimig verklebten, sehr kleinen, kokkenartigen Konidien zu unterscheiden. Nur bei sehr starker Vergrösserung sieht man, dass typische Träger fehlen und die Konidien von der zart prosenchymatischen, obersten Schicht des Basalstromas gebildet werden.

Diacrochordon n. gen., eine neue Gattung der Sphaeriales.

Von F. Petrak (Wien).

Diacrochordon Petr. n. gen.

Perithecia laxissime dispersa, omnino et profunde innata, subglobosa vel late ellipsoidea, saepe plus minusve compressa, tunc angulosa et irregularia, probabiliter ostiolo obliquo, subelongato praedita; pariete pseudoparenchymatico, atro-brunneo; asci subnumerosi, crasse clavati, fortasse etiam plus minusve fusoiddei, 8-spori, mox viescentes et mucosi; sporae oblongo-ellipsoideae, utrinque plus minusve attenuatae, tunc oblongo-fusoideae, rectae, hyalinae, triseptatae, septo medio tenuissimo, septo altero prope imam basin, septo tertio prope apicem extremum sito; pseudoparaphyses (?) sat numerosae, mox viescentes et omnino mucosae.

Perithezien sehr locker zerstreut, vollständig und meist ziemlich tief eingewachsen, rundlich oder breit ellipsoidisch, oben und unten oft stark abgeflacht, dann unregelmässig, wahrscheinlich mit schiefem, etwas verlängertem Ostiolum; Peritheziummembran häutig, aussen von schwarzbraunem, pseudoparenchymatischem, innen konzentrisch faserigem, heller gefärbtem Gewebe; Aszi ziemlich zahlreich, dick keulig, vielleicht auch etwas spindelig, 8-sporig, bald ganz verschleimend; Sporen länglich ellipsoidisch, beidendig verjüngt, oft auch etwas spindelig, meist gerade, mit drei Querwänden, von denen sich eine ungefähr in der Mitte, die beiden anderen in der Nähe der Enden befinden, $40 \rightleftharpoons 20\ \mu$; Pseudoparaphysen (?) ziemlich zahlreich, schon ganz verschrumpft und verschleimt, eine krümelige, viele kleinere und grössere Öltröpfchen enthaltende, schleimige Masse bildend.

Diacrochordon Rehmii Petr. n. spec.

Perithecia laxissime et irregulariter dispersa, plerumque solitaria, omnino et profunde immersa, subglobosa vel late ellipsoidea, superne et saepe etiam inferne applanata, tunc fere tympaniformia vel obtuse angulosa, 250—350 μ diam., probabiliter ostiolo obliquo, subelongato praedita; pariete membranaceo, 16—30 μ crasso, contextu extus pseudoparenchymatico, atro-olivaceo, e cellulis rotundato-angulosis, 4—10 μ diam. metientibus composito, intus pellucide olivaceo, concentrice fibroso; asci sat numerosi, crasse clavati, fortasse etiam oblongo-fusoidei, probabilitier subsessiles vel brevissime stipitati,

8-spori, mox viescentes et mucosi, ut videtur, ca. 100—130 ⇌ 28—32 μ; sporae probabiliter plus minusve distichae, oblongo-ellipsoideae, utrinque saepe plus minusve attenutae, tunc oblongo-fusoideae, rectae, raro inaequilaterae, hyalinae, 30—50 ⇌ 13—16.5 μ, triseptatae, ad septum medium tenerrimum, non vel lenissime constrictae, septo altero prope imam basin, septo tertio prope apicem extremum sito, loculis duobus extremis depresso-hemisphaericis vel papilliformibus, ca. 3.5—4.5 μ longis, ad septum 5—6 μ latis, episporio fere 0.5 μ crasso, regulariter et tenerrime parallele striolato; pseudoparaphyses (?), ut videtur, subnumerosae, iam omnino mucosae.

Perithezien sehr locker und unregelmässig zerstreut, meist ganz vereinzelt, vollständig und meist ziemlich tief eingewachsen, mehr oder weniger rundlich oder breit ellipsoidisch, oben und unten mehr oder weniger, oft ziemlich stark abgeflacht, dann einen pauken- oder stumpf viereckigen Querschnitt zeigend, 250—350 μ im Durchmesser, wahrscheinlich mit schiefem, etwas verlängertem Ostiolum. Peritheziummembran häutig, 16—23 μ, selten bis ca. 30 μ dick, mit ca. 10 μ dicker Aussenkruste von pseudoparenchymatischem, aus ungefähr isodiametrischen, unregelmässig eckigen, kaum oder schwach zusammengepressten, ziemlich dünnwandigen, 4—10 μ grossen Zellen bestehender Aussenkruste und mehr oder weniger heller gefärbter, schliesslich oft subhyalin werdender, konzentrisch faseriger Innenschicht. Aszi ziemlich zahlreich, dick keulig, vielleicht auch länglich spindelig, wahrscheinlich fast sitzend oder sehr kurz gestielt, 8-sporig, bald ganz verschleimend, ca. 100—130 ⇌ 28—32 μ. Sporen wahrscheinlich mehr oder weniger zweireihig, länglich ellipsoidisch, beidendig oft, zuweilen auch ziemlich stark verjüngt, dann länglich spindelförmig mit 3 Querwänden, an der in der Mitte befindlichen, sehr zarten, oft ziemlich undeutlichen Querwand schwach oder nicht eingeschnürt. Durch die beiden anderen, in der Nähe der Enden befindlichen Querwände sind die beiden Endzellen im Verhältnis zu den Mittelzellen sehr klein, flach halbkugelig oder kappenförmig, 3.5—4.5 μ lang, an der Querwand 5—6 μ breit. Die Sporen sind ca. 30—45 μ, selten bis 50 μ lang, 13—16.5 μ breit. Das deutlich sichtbare, fast 0.5 μ dicke Epispor ist sehr zart parallelstreifig. Pseudoparaphysen (?) sind sicher und wohl auch ziemlich zahlreich verhanden, aber schon ganz verschrumpft und verschleimt. Mit den fast ganz aufgelösten Schläuchen bilden sie eine schleimige, locker feinkörnige, zahlreiche kugelige, bis ca. 13 μ grosse, ziemlich stark lichtbrechende Öltröpfchen enthaltende Masse.

Auf faulenden, mit Sand bedeckten Faschinen am Ufer des Lech bei Augsburg in Bayern, leg. Britzlmayr. — Rehm, Ascom. exs. Nr. 531 p. p.

Diesen schönen, durch den eigenartigen Bau der Sporen sehr ausgezeichneten Pilz habe ich sehr spärlich in überreifem Zustande in Gesellschaft von *Ceratosphaeria aeruginosa* Rehm. auf einem Exemplare dieser von Rehm in seinem Exsikkatenwerke unter Nr. 531 ausgegebenen Art gefunden. Ich habe von mehreren Perithezien zahlreiche Schnitte angefertigt, konnte aber niemals auch nur die Spur einer Mündung finden. Parallel zur Substratoberfläche verlaufende Schnitte konnten von dem spärlichen Material nicht angefertigt werden. In der ganz überreifen Fruchtschicht waren die Aszi nur in undeutlichen Umrissen zu erkennen, weshalb sie auch nicht genau beschrieben und gemessen werden konnten. Die systematische Stellung dieses Pilzes lässt sich auf Grund des mir vorliegenden, sehr spärlichen und überreifen Materiales nicht sicher beurteilen. Manche Anzeichen sprechen dafür, dass er den Diaportheen nahe stehen dürfte. Nach besser entwickeltem Material wird diese Frage zu entscheiden und seine Beschreibung zu ergänzen oder zu berichtigen sein.

Esfandiaria n. gen., eine neue, sehr isoliert stehende, phaeodidymospore Gattung der Askomyzeten.

Von F. Petrak (Wien).

Esfandiaria Petr. n. gen.

Peritheeia laxe dispersa, plus minusve innata, nunc parum nunc plus minusve erumpentia, tunc interdum fere superficialia, globosa, late ovoidea vel ellipsoidea, ostiolo crasse cylindraceo-conoideo, antice late rotundato vel truncato, in maturitate late, interdum fere calyciformiter aperto praedita, in humido manifeste intumescentia, pariete carnoso- vel cartilagineo-gelatinoso, strato exteriore usque ad basis marginem tantum evoluto ibique circumcirca volvato-incrassato, contextu pseudoparenchymatico, griseo- vel olivaceo-brunneo, apicem versus verticaliter fibroso, strato interiore inferne tantum evoluto, subhyalino, minute celluloso; asci numerosi, cylindracei, brevissime stipitati, tenuiter tunicati, 8-spori; sporae ellipsoideae vel oblongo-ovoideae, raro subfusoideae, atro-brunneae, medio sepiatae; paraphyses numerosae, tenuiter fibrosae, ascos multo superantes, sero mucosae.

Fruchtgehäuse zerstreut, mehr oder weniger tief eingewachsen, bisweilen nur mit dem Scheitel, meist jedoch mehr oder weniger hervorbrechend, rundlich, breit eiförmig oder ellipsoidisch, mit ziemlich dick zylindrisch-kegelförmigem, zuweilen etwas verlängertem, oben breit abgerundetem oder abgestutztem, sich bei der Reife weit, oft fast kelchförmig öffnendem Ostiolum, in feuchtem Zustande ziemlich stark aufquellend. Peritheziummembran von gelatinös-fleischiger oder fast knorpelig-gelatinöser Beschaffenheit, aus zwei Schichten bestehend. Äussere Schicht nur bis zum Rande der Basis reichend, hier ringwulstartig oder kragenförmig verbreitert, in der unteren Hälfte pseudoparenchymatisch, grau- oder schwarzbraun, oben senkrecht faserig werdend. Innenschicht nur unten, von fleischigem, subhyalinem, kleinzelligem Gewebe, auf der Innenfläche von der Fruchtschicht überzogen. Aszi zahlreich, zylindrisch, sehr lang gestielt, dünnwandig. Sporen ellipsoidisch, länglich-eiförmig, selten etwas spindelig, meist gerade, in der Mitte septiert, schwarzbraun, $10 \rightleftharpoons 5$ µ; Paraphysen zahlreich, derb- aber dünnfädig, meist einfach, die Aszi überragend, sehr spät verschleimend.

Esfandiaria insignis Petr. n. spec.

Perithecia late et irregulariter dispersa, solitaria, raro bina complurave subaggregata, plus minusve profunde innata, nunc vix vel parum, nunc plus minusve erumpentia, tunc interdum fere superficialia, globosa, late ellipsoidea vel ovoidea, 250—350 μ diam., interdum etiam paulo majora, ostiolo crasse cylindraceo-conoideo, usque ad 150 μ alto, ad basin ca. 100—130 μ crasso, antice late rotundato vel truncato, in maturitate late, saepe fere calyciformiter aperto praedita, in humido manifeste intumescentia, pariete carnoso- vel cartilagineo-gelatinoso, strato exteriore usque ad basis marginem tantum evoluto ibique circumcirca volvato-incrassato contextu inferne pseudoparenchymatico, e cellulis rotundato-angulosis, pro ratione crassiuscule tunicatis, extus griseo- vel olivaceo-brunneis, intus subhyalinis, ca. 4—10 μ diam. metientibus composito, superne verticaliter et parallele fibroso, strato interiore inferne tantum distincte evoluto, contextu pseudoparenchymatico e cellulis hyalinis vel subhyalinis, ca. 3—6 μ diam. metientibus composito; asci numerosi, cylindracei, apice rotundati, postice abruptiuscule in stipitem brevissimum attenuati, tenuiter tunicati, 8-spori, p. sp. 52—70 ⇌ 5—6.5 μ; sporae monostichae, ellipsoideae vel ovoideo-oblongae, utrinque obtusae, vix vel parum attenuatae, tunc subfusoideae, rectae vel inaequilaterae, circa medium septatae, non constrictae, atro-brunneae, 8—13 ⇌ 4.5—6 μ; paraphyses numerosae, tenuiter fibrosae, simplices, raro furcatae, ca. 1.5 μ crassae, ascos superantes, sero mucosae.

Fruchtgehäuse sehr locker zerstreut, meist einzeln, selten zu zwei oder mehreren etwas dichter beisammen oder hintereinander stehend, mehr oder weniger tief eingewachsen, bisweilen nur mit dem Scheitel, nicht selten aber auch stärker hervorbrechend und dann fast oberflächlich werdend, rundlich, breit eiförmig oder ellipsoidisch, ca. 250—350 μ im Durchmesser, selten noch etwas grösser, oben ziemlich rasch in das kegelförmig-zylindrische, an der Spitze breit abgerundete oder ziemlich scharf abgestutzte, bis ca. 150 μ hohe, am Grunde 100—130 μ dicke, sich bei der Reife mehr oder weniger weit, oft fast kelchförmig öffnende Ostiolum übergehend, in feuchtem Zustande deutlich aufquellend. Die Aussenkruste der Wand hat eine fleischig-gelatinöse oder knorpelig-gelatinöse Beschaffenheit, fehlt unten vollständig und bildet am Rande der Basis entweder einen ca. 60—100 μ dicken Ringwulst oder eine dem Substrat fest auf- und etwas eingewachsene, bis ca. 160 μ weit vorspringende, ca. 30 μ dicke, kreisring- oder kragenförmige Platte, die sich aussen in ziemlich hell oilvbraune, innen in hyaline, undeutlich und entfernt septierte, meist einfache, 2.5—4 μ dicke Hyphen auflöst. Sie besteht im unteren Drittel aus mehr oder weniger deutlichen, rundlich eckigen, relativ dickwandigen, aussen ziemlich hell graubraunen, innen subhyalinen,

4—10 μ grossen Zellen. Nach oben wird die äussere Wandschicht allmählich stärker und wird am oberen Rande des Ostiolums bis zu 70 μ dick. Weiter oben strecken sich die Zellen allmählich und gehen im Ostiolum in senkrecht parallele, ziemlich entfernt septierte, aussen mehr oder weniger dunkel grau- oder schwarzbraune, innen durchscheinend gelb- oder olivbraune, endlich plötzlich hyalin werdende, 2.5—4 μ dicke Hyphen über. Die nur unten gut entwickelte, an den Seiten ungefähr bis zur halben Höhe des Gehäuses reichende, stark konvexe, in einer entsprechend konkaven Vertiefung des Substrates liegende Innenschicht der Wand ist ca. 25 μ dick und besteht aus rundlich eckigen, hyalinen, in dickeren Schichten sehr hell gelbbräunlich gefärbt erscheinenden, relativ dickwandigen, inhaltsreichen, ca. 3—6 μ grossen Zellen und wird innen von der Fruchtschicht überzogen. Aszi zahlreich, zylindrisch, oben stumpf abgerundet, unten plötzlich in einen kurzen Stiel verjüngt, dünnwandig, 8-sporig, p. sp. 52—70 ⇌ 5—6.5 μ; Sporen einreihig, hintereinander oder etwas schief liegend, ellipsoidisch oder länglich-eiförmig, beidendig breit abgerundet, kaum oder schwach verjüngt, dann etwas keulig oder spindelig, gerade, selten ungleichseitig, in der Mitte septiert, nicht eingeschnürt, schwarzbraun, 8—11 μ, vereinzelt bis ca. 13 μ lang, 4.5—6 μ breit, Paraphysen zahlreich, dünn- aber ziemlich derbfädig, einfach, selten gabelig geteilt, ca. 1.5 μ dick, die Aszi überragend, oben frei, sehr spät verschleimend.

Auf einem entrindeten Ast- oder holzigen Stengelfragment; Iran; Baloutchestan: Tang varheh, 25. III. 1949, leg. G. Scharif.

Das mir vorliegende Material dieses hochinteressanten, sehr eigenartigen, Herrn Direktor Dr. E. Esfandiari in Teheran zu Ehren benannten Pilzes ist spärlich, aber prächtig entwickelt. Der in der obigen Beschreibung ausführlich geschilderte Bau der in frischem Zustande ziemlich stark aufquellenden Peritheziummembran, das dicke, sich bei der Reife von unten nach oben weit, oft fast kelchförmig öffnende Ostiolum und die langen, die Aszi weit überragenden, dünnen, aber sehr derbfädigen Paraphysen sind Merkmale, die diesen, eine ganz isolierte Stellung einnehmenden Pilz sehr auszeichnen. Mir ist bis heute kein Askomyzet bekannt geworden, von dem sich behaupten oder auch nur vermuten liesse, dass er mit *Esfandiaria insignis* näher verwandt sei.

Romellina n. gen., eine neue Gattung der phaeosporen Pyrenomyzeten.

Von F. Petrak (Wien).

Romellina Petr. n. gen.

Stromata in lecaniis, *Aschersonia* vel *Hypocrella* quadam infectis parasitica, ambitu orbicularia vel elliptica, tenuiter pulvinata, marginem versus fere membranacea, contextu horizontaliter prosenchymatico, atro-brunneo, e margine in hyphas pallide olivaceas vel obscure melleas excurrentia; perithecia nunc minora, globosa vel ovoidea, tunc stromati omnino immersa, ostiolo tantum punctiformiter prominula, nunc majora, tunc plus minusve, saepe fere omnino superficialia, ostiolo elongato, crassiuscule cylindraceo praedita; pariete membranaceo, pseudoparenchymatico, atro-brunneo; asci subnumerosi, late ovoidei vel subglobosi, probabiliter, 4-spori; sporae quoad formam variabilia, plerumque subglobosa, late ovoidea vel ellipsoidea, raro breviter cylindracea vel cylindraceo-conica, plerumque obtuse angulosa, continua, obscure olivacea; paraphyses (?) omnino mucosae.

Stromata auf Schildläusen, die von *Aschersonia* oder *Hypocrella* befallen sind, parasitierend, im Umriss rundlich oder breit elliptisch, sehr dünn, polsterförmig, gegen den Rand hin häutig werdend, von horizontal prosenchymatischem, schwarzbraunem Gewebe, am Rande in hell olivbraune oder dunkel honiggelbe Hyphen ausstrahlend. Perithezien teils ziemlich klein, kugelig oder eiförmig, dem Stroma ganz eingesenkt mit punktförmig hervorbrechendem Ostiolum, teils ziemlich gross, dann mehr oder weniger, zuweilen fast ganz oberflächlich dem Stroma aufgewachsen, mit verlängertem, zylindrischem Ostiolum; Peritheziummembran pseudoparenchymatisch, schwarzbraun, häutig. Aszi ziemlich zahlreich, breit eiförmig oder fast kugelig, wahrscheinlich 4-sporig. Sporen von sehr verschiedener Form, meist kugelig, breit eiförmig oder ellipsoidisch, selten kurz zylindrisch oder gestutzt kegelförmig, meist stumpfeckig, einzellig, dunkel olivbraun, $12 \rightleftharpoons 9$ μ oder ca. 10.5 μ im Durchmesser. Paraphysen (?) ganz verschleimt.

Romellina variabilis Petr. n. spec.

Stromata laxe et irregulariter dispersa, in lecaniis *Aschersonia* vel *Hypocrella* quadem infectis parasitica, ambitu orbicularia vel late elliptica, plerumque arte limitata, tenuiter pulvinata, marginem, ver-

sus paulatim tenuiora, denique membranacea, 1.2—2.3 mm diam. aterrima, contextu horizontaliter prosenchymatico, inferne saepe flavobrunneo vel pallide olivaceo, e cellulis plus minusve isodiametricis usque ad 15 μ diam. metientibus, superne e cellulis fere opace atrobrunneis, plus minusve horizontaliter protractis, usque ad 20 μ longis, crasse tunicatis composito, e margine in hyphas pellucide olivaceas vel obscure melleas, subremote septatas, undulato-curvulas, 4—7 μ crassas excurrente; perithecia quoad magnitudinem variabilia, minora stromati plerumque omnino immersa, globosa vel late ovoidea, 100—150 μ diam., plus minusve depressa, ostiolo papilliformi punctiformiter erumpentia, majora plus minusve prominula, non raro fere superficialia, usque ad 350 μ diam. metientia, ostiolo elongato-cylindraceo, apicem versus paulatim sed parum attenuato, usque ad 900 μ longo, inferne 90—110 μ crasso, fragillimo praedita; asci subnumerosi, late ovoidei vel subglobosi, ut videtur 4-spori; sporae quoad formam variabilia, subglobosa, late ovoidea, raro truncato-conica vel breviter cylindracea, plerumque angulosa et saepe irregularia, utrinque late rotundata vel plus minusve truncata, continua, olivacea, 9—15 ⇌ 6—11 μ vel ca. 9—12 μ; paraphyses (?) iam omnino mucosae, nec conspicuae.

Auf der Blattunterseite sind mehr oder weniger zahlreiche, sehr locker zerstreute, meist ganz vereinzelte, oft ganz steril bleibende, im Umriss rundliche oder breit elliptische, ziemlich scharf begrenzte, matt schwarze, vom Rande gegen die Mitte flach vorgewölbte Stromata von 1.2—2.3 mm im Durchmesser vorhanden. Diese entwickeln sich stets auf Schildläusen, die von einer *Aschersonia* oder *Hypocrella* befallen wurden. In vorgerücktem Stadium der Entwicklung sind vom Gewebe des Wirtes nur kleine, krümelige Reste vorhanden. Das Stroma besteht aus mehr oder weniger zahlreichen, zur Oberfläche parallelen Lagen von unten oft ziemlich hell gelb- oder olivbräunlich gefärbten, mehr oder weniger isodiametrischen, meist nicht über 15 μ grossen, weiter oben aus fast opak schwarzbraunen, dickwandigeren, in horizontaler Richtung mehr oder weniger stark gestreckten, bis ca. 20 μ langen Zellen. Das Stromagewebe wird oft von kleinen, ganz unregelmässigen Hohlräumen unterbrochen, löst sich an der Oberfläche in zahlreiche, kurze, meist nur 1—3-zellige, schwarzbraune Hyphen auf, während es am Rande in zahlreiche, mehr oder weniger radiär ausstrahlende, verschieden lange, meist wellig gekrümmte, 4—7 μ dicke Hyphen übergeht. Die Perithezien sind dem Stroma oft ganz eingewachsen, dann ziemlich klein, nur ca. 100—150 μ im Durchmesser, rundlich, oft ziemlich stark zusammengedrückt, nur mit dem papillenförmigen oder stumpf konischen Ostiolum punktförmig hervorbrechend. Die grösseren, bis ca. 350 μ Durchmesser erreichenden, rundlichen, breit eiförmigen Perithezien entwickeln

sich mehr oder weniger oberflächlich, sind entweder nur mit der Basis auf- oder ungefähr bis zur halben Höhe dem Stroma eingewachsen. Sie gehen am Scheitel in ein bis ca. 900 μ langes, am Grunde 90—100 μ dickes, oben stumpf, oft fast gestutzt abegrundetes, zylindrisches, sich nach oben allmählich schwach, aber meist deutlich verjüngendes, sehr leicht abbrechendes, schnabelförmiges Ostiolum über. Dieses besteht aus senkrecht parallelen, aber oft etwas gekrümmten, kurzgliederigen, fast opak schwarzbraunen, ca. 4—6 μ breiten, ziemlich fest miteinander verwachsenen Hyphen. Perithezium-membran häutig, im Alter etwas brüchig werdend, unten oft nur 20—30 μ, oben bis ca. 70 μ dick, aus mehr oder weniger zahlreichen Lagen unregelmässig oder rundlich eckigen, ziemlich dickwandigen, dunkel schwarzbraunen, 8—13 μ, selten bis ca. 18 μ grossen Zellen bestehend, aussen keine scharfe Grenze zeigend, unten allmählich in das Stromagewebe übergehend, sich an der Oberfläche in kurze Hyphenenden auflösend und als kleine, krümelige Zellkomplexe ablösend. Innen geht die Membran plötzlich in eine ca. 6—10 μ dicke Schicht über, die undeutlich kleinzellig, hyalin oder subhyalin, oft auch schon stark verschleimt ist. Aszi ziemlich zahlreich, breit eiförmig oder rundlich, ca. 45 ⇌ 35, wahrscheinlich 4-sporig. Sporen von sehr verschiedener Form, rundlich, breit eiförmig oder ellipsoidisch, seltener gestutzt konisch oder fast zylindrisch, meist stumpfeckig, oft von fast quadratischem Umriss, oben kaum, unten zuweilen stärker verjüngt, oft ganz unregelmässig, einzellig, dunkel olivbraun, mit glattem, ca. 0.5 μ dickem Epispor, 9—13 μ, selten bis 15 μ lang, 6—11 μ breit oder ca. 9—12 μ im Durchmesser.

Auf der Unterseite grosser Blätter einer monokotylen Pflanze; Java; Tjibodas, 4. II. 1897, leg. H. Möller.

Der hier beschriebene Pilz scheint die von *Aschersonia-Hypocrella* infizierten Schildläuse schon sehr frühzeitig zu befallen. Das Wirtsgewebe wird fast ganz aufgezehrt und zum Verschwinden gebracht. Die meisten Stromata scheinen dauernd steril zu bleiben. Die Perithezien entwickeln sich unregelmässig und locker zerstreut auf der ganzen Fläche des Stromas oder nur in der Mitte, dann mehr oder weniger dicht gehäuft, bisweilen aber nur am Aussenrande des Stromas. Ob die langen, fast schnabelartigen Mündungen stets vorhanden sind, konnte nicht sicher festgestellt werden. Ich halte es für wahrscheinlich, dass sie stets, wenn auch in sehr verschiedener Länge gebildet werden, aber leicht abbrechen und dann zu fehlen scheinen. Obwohl zahlreiche Gehäuse untersucht wurden, konnte eine gut entwickelte Fruchtschicht nicht gefunden werden. Der ganze Hohlraum der Perithezien wird von einer schleimigen Masse erfüllt, in der viele reife und unreife, oft noch ganz hyaline Sporen regelmässig verteilt sind. Nur ein einziger, ganz verschrumpfter,

unreifer Schlauch von der oben angegebenen Grösse konnte gefunden werden.

Unter allen, bisher bekannt gewordenen Pyrenomyzetengattungen ist *Romellina* durch Wachstum und Bau des Stromas, durch die lang geschnäbelten Gehäuse, ganz besonders aber durch die Form der Sporen sehr ausgezeichnet und leicht kenntlich. Sie scheint auch eine ganz isolierte Stellung einzunehmen und wurde dem Andenken des bekannten, schwedischen Mykologen L. Romell zu Ehren benannt, in dessen Herbar das oben erwähnte Exemplar des Pilzes gefunden wurde.

Uber Didymella Sacc. und die neue Gattung Pseudomassariella n. gen.

Von F. Petrak (Wien).

Wie die meisten älteren, artenreichen Gattungen ist auch *Didymella* Sacc. eine Mischgattung, bei der von den Autoren die meisten, auf Blättern und Kräuterstengeln wachsenden, stromalosen Pyrenomyzeten mit hyalinen, zweizelligen Sporen und Paraphysen eingereiht wurden. Schon vor Jahren habe ich erkannt, dass diese Gattung verschiedene heterogene Elemente enthält, die ganz anders beurteilt und eingereiht werden müssen. Als erste, vom *Didymella*-Typus ganz verschiedene Art wurde *D. fenestrans* (Duby) Sacc. von mir in die neue Gattung *Sydowiella* Petr. in Annal. Mycol. XXI. p. 30 (1923) eingereiht. Bald darauf wurde auch für *Didymella tosta* (B. et Br.) Sacc. die neue Gattung *Paradidymella* Petr. l. c. XXV. p. 238 (1927) aufgestellt.

Typus der Gattung ist *Didymella applanata* (Niessl) Sacc., eine echt dothideale Form. Sehr viele der von mir bisher nachgeprüften Arten stimmen mit der genannten Typusart mehr oder weniger gut überein. Ähnlich wie bei *Leptosphaeria, Pleospora* und anderen Pleosporaceen-Gattungen kann man aber auch bei *Didymella* mehrere Bautypen der Schlauchform unterscheiden, die meist auch verschiedene Nebenfruchtformen haben; mir sind bisher die folgenden bekannt geworden:

1. *Didymella pinodes* (Br. et Blox.) v. Höhn. — Perithezien klein, Gehäusemembran dünnhäutig; meist Parasiten. Nebenfruchtformen *Ascochyta-Diplodina.*

2. *Didymella applanata* (Niessl) Sacc. — Perithezien mittelgross. Peritheziummembran häutig. Meist Saprophyten. Zu *Phoma* gehörige Nebenfruchtformen.

3. *Didymella cladophila* (Niessl) Sacc. — Perithezien mittelgross, oft mit mehr oder weniger gut entwickeltem Klypeus. *Dendrophoma*-artige Nebenfruchtformen.

4. *Didymella eupyrena* Sacc. — Fruchtgehäuse ziemlich gross. Peritheziummembran dick- und derbhäutig. Sporen meist etwas unterhalb der Mitte septiert. Saprophyten. Nebenfruchtformen *Plenodomus.*

Eine von diesen *Didymella*-Typen ganz verschiedene Art ist *D. vexata* Sacc. Sie muss in eine neue Gattung eingereiht werden

und soll hier auf Grund zahlreicher, von mir bei M.-Weisskirchen gesammelter, prächtig entwickelter Exemplare zuerst etwas ausführlicher beschrieben werden:

Perithezien weitläufig, ziemlich gleichmässig und dicht zerstreut oder locker herdenweise, dünnere Äste mit allen Seitenästchen oft ganz überziehend, aber meist einzeln, seltener zu zwei oder mehreren dichter beisammenstehend, dann oft etwas verwachsen, sich subepidermal oder unter dem Periderm entwickelnd, mehr oder weniger, oft ziemlich stark niedergedrückt rundlich oder breit ellipsoidisch, selten etwas unregelmäsisg, 250—300 μ im Durchmesser, selten noch etwas grösser, nur mit dem ganz flachen, papillenförmigen, sich erst spät durch einen rundlichen, ziemlich unscharf begrenzten Porus öffnenden Ostiolum punktförmig hervorbrechend. Perithezienmembran häutig, oben ca. 20—30 μ, an den Seiten bis ca. 50 μ dick, aus mehreren Lagen von dünnwandigen, mehr oder weniger hell gelb- oder rotbraun gefärbten, oben rundlich eckigen, kaum oder nur schwach zusammengepressten, ca. 6—10 μ grossen, unten und an den Seiten bis ca. 15 μ langen, aber nur ca. 2.5 μ hohen, stark zusammengepressten Zellen bestehend, sich besonders an den Seiten in mehr oder weniger zahlreiche, verzweigte, ziemlich entfernt septierte, dünnwandige, hell gelb- oder olivbräunliche, 2—3.5 μ breite Hyphen auflösend. Aszi in geringer Zahl, länglich-ellipsoidisch, beidendig breit abgerundet, kaum oder schwach, nur unten oft etwas stärker verjüngt, dann oft etwas keulig, ziemlich dünnwandig, 8-sporig, 55—85 μ, selten bis 95 μ lang, 23—32 μ breit. Sporen mehr oder weniger zweireihig, länglich ellipsoidisch oder länglich eiförmig, beidendig breit abgerundet, nicht oder nur sehr schwach verjüngt, gerade, selten ungleichseitig oder sehr schwach gekrümmt, ungefähr in der Mitte septiert, nicht oder nur sehr undeutlich eingeschnürt, mit homogenem, ziemlich grobkörnigem Plasma, hyalin, sich im Alter und wohl immer erst ausserhalb der Schläuche sehr hell gelblich oder gelbbräunlich färbend, 21—30 ⇌ 9—12 μ; Paraphysen ziemlich zahlreich, aus locker aber ziemlich reich verzweigten, sehr zartwandigen, 2.5—4 μ breiten, locker körniges Plasma und kleine Öltröpfchen enthaltenden, über den Schläuchen ein dichtes, fast zellig gebautes Geflecht bildenden Fäden bestehend, bald verschrumpfend und verschleimend.

Pseudomassariella Petr. n. gen.

Perithecia dispersa vel subgregaria, sub epidermide vel sub peridermio evoluta, plus minusve depressa, globosa vel late ellipsoidea, omnino tecta, ostiolo plano, papilliformi tantum, poro rotundato sero aperto punctiformiter erumpentia; pariete membranaceo, contextu pseudoparenchymatico, flavo-brunneo vel rufo-brunneo; asci pauci, oblongo-ellipsoidei vel crasse clavati, fere sessiles, tenuiter tunicati,

8-spori; sporae ellipsoideae vel oblongo-ovoideae, plerumque rectae, medio septatae, hyalinae, denique pallide flavo-brunneolae: paraphyses subnumerosae, ramosae, tenuiter tunicatae, supra ascos dense contextae, mox viescentes et mucosae.

Perithezien zerstreut oder locker herdenweise, sich subepidermal oder unter dem Periderm entwickelnd, niedergedrückt rundlich oder breit ellipsoidisch, dauernd bedeckt, nur mit dem ganz flachen, papillenförmigen, sich erst spät durch einen rundlichen Porus öffnenden Ostiolum punktförmig hervorbrechend. Peritheziummembran häutig, von pseudoparenchymatischem, hell gelb- oder rotbräunlichem Gewebe. Aszi in geringer Zahl, schmal ellipsoidisch oder dick keulig, zartwandig, 8-sporig. Sporen schmal ellipsoidisch oder länglich-eiförmig, meist gerade, in der Mitte septiert, hyalin, im Alter zuweilen hell gelbbräunlich werdend, 25/10 μ. Paraphysen ziemlich zahlreich, reich verzweigt, sehr zartwandig, über den Schläuchen ein dichtes, fast zelliges Geflecht bildend, bald verschrumpfend und verschleimend..

Pseudomassariella vexata (Sacc.) Petr. nov. comb.

Syn.: *Didymella vexata* Sacc. in Michelia, II. p. 58 (1880).

Didymosphaeria vexata Wint. in Rabh. Kryptofl. ed. 2. II. p. 422 (1885).

Didymosphaeria oblitescens Fuck. Symb. Myc. Nachtr. I. p. 301 (1871) nec *Sphaeria oblitescens* B. et Br.

Wie schon aus der oben mitgeteilten Beschreibung klar hervorgehen dürfte, ist *Pseudomassariella* mit *Pseudomassaria* Jacz. am nächsten verwandt, aber durch die in der Mitte septierten Sporen hinreichend verschieden.

Neue Literatur.

Barnett, H. L., Illustrated Genera of Imperfect Fungi. — Burgess publishing Co. Minneapolis, Minns., USA. 1955. 213 pp., 302 Fig. — Kart. $ 4.00.

Mit Rücksicht auf die grosse Bedeutung, die den imperfecten Pilzen in der Landwirtschaft, Industrie und Medizin zukommt, ist ihre Kenntnis für die Studierenden der Mykologie sehr wichtig, auch deshalb, weil das Studium dieser überaus formenreichen Pilze mit besonderen Schwierigkeiten verbunden ist. Auf Grund von Erfahrungen, die Verfasser bei seinen, an der West Virginia Universität gehaltenen mykologischen Vorlesungen sammeln konnte, hat er sich entschlossen, das vorliegende Werk zu verfassen, in welchem 302 Gattungen der Fungi imperfecti abgebildet sind und kurz charakterisiert werden. Aufgenommen wurden von den zur Zeit bekannten Gattungen dieser Pilze vor allem solche, deren Vertreter häufig vorkommen oder als Krankheitserreger ein grösseres Interesse beanspruchen können.

Von den Abbildungen wurden 182 nach Originalzeichnungen des Verfassers, die übrigen nach Illustrationen verschiedener Autoren angefertigt, deren Quellen genau zitiert werden. Vorangestellt wurde ein Bestimmungsschlüssel für alle, im speziellen Teile enthaltenen Gattungen.

Die Abbildungen sind ganz primitiv und sollen vor allem die charakteristischen Merkmale der Gattungen zur Darstellung bringen. Man wird deshalb besonders naturgetreue Zeichnungen nicht erwarten dürfen. Die Abbildungen der konidialen Phycomyceten und Hyphomyceten können der Hauptsache nach als gut bezeichnet werden. Weniger gut, zum Teil schlecht oder ganz falsch sind die Abbildungen der Sphaeropsideen und Melanconieen, was hier an einer kleinen Auswahl besonders krasser Fälle gezeigt werden soll:

224. *Pyrenochaeta* sp. ist vom Typus dieser Gattung ganz verschieden. — 227. *Phomopsis vexans*. Die Konidienträger sind im Verhältnis zu ihrer Länge viel zu dick und auch der Form nach ganz unrichtig gezeichnet. — 228. *Macrophoma* sp. ist wahrscheinlich eine stromalose *Botryodiplodia*. — 231. *Asteroma* sp. gehört wahrscheinlich zu *Phyllostictina*. — 233. *Sphaeronema acerinum* gehört in die Gattung *Lagynodella!* — 236. *Dothiorella* sp. ist nach der Abbildung eine junge *Botryodiplodia*. — 237. *Cytospora leucostoma* Träger und Konidien sind sehr schlecht gezeichnet. — 246. *Sphaeropsis malorum* ist eine *Botryodiplodia!* — 253. *Diplodina macrospora* ist vom Typus der Gattung ganz verschieden. — 254. *Diplodia zeae* ist vom *Diplodia*-Typus ganz verschieden; gehört zu *Macrodiplodia*. — 268. *Phlyctaena albocincta* scheint nach der Zeichnung das B-Stadium einer *Phomopsis* zu sein. — 271. *Phlcospora robiniae* ist eine *Septoria!* — 250. *Chaetomella atra* gehört in die Gattung *Amerosporium*. — 278. *Phaeoseptoria festucae* var. *muhlenbergiae* ist eine scolecospore *Hendersonia!* — 283. *Gloeosporium nervisequum* gehört zu *Gloeosporidium!* — 291. *Septogloeum profusum* ist vom Gattungstypus weit verschieden; ist wahrscheinlich eine melanconioide *Septoria*. — 296. *Cryptosporium pinicola* ist vom

Typus der Gattung ganz verschieden und wahrscheinlich eine Parasphaeropsidee.

Trotz der hier angeführten und zahlreichen anderen, weniger wichtigen Mängel und Irrtümer wird dieser Bilderatlas den Studierenden der Mykologie gute Dienste leisten und sie bei Bestimmungen der Fungi imperfecti unterstützen. Eine neue Auflage müsste freilich durch Vermeidung und Berichtigung der vielen Fehler und Irrtümer noch wesentlich verbessert werden.

Chupp, Ch., A Monograph of the Fungus Genus *Cercospora*. — Selbstverlag; Dept. of Plant Pathology, Ithaca, N.Y., USA., 1953, 667 pp., 222 Textfig. — Ganzln. $ 10,00.

Das vorliegende, auf langjährigen Studien beruhende Werk ist eine gründliche Bearbeitung der über die ganze Welt in zahlreichen Arten verbreiteten Gattung, deren typische Vertreter wohl alle echte Parasiten sind und als Nebenfruchtformen zu *Mycosphaerella* gehören.

In einer kurzen, der Geschichte, Charakteristik und Synonymie der Gattung gewidmeten Einleitung wird auch ein Schlüssel zur Bestimmung und Unterscheidung von vierzig Hyphomyceten-Gattungen mitgeteilt, die von manchen Autoren mit *Cercospora* verwechselt wurden. Im speziellen Teile werden in alphabetischer Reihenfolge der Nährpflanzenfamilien etwas mehr als 1200 Arten angeführt, darunter zahlreiche, die hier zuerst als neu beschrieben werden. Ein allgemeiner Bestimmungsschlüssel konnte mit Rücksicht auf die grosse Zahl von zum Teil oft sehr nahe verwandten Arten nicht gegeben werden. Bei vielen Familien und Gattungen der Nährpflanzen, auf denen mehrere *Cercospora*-Arten vorkommen, wurden aber zur leichten Unterscheidung solcher Artgruppen kurze Bestimmungsschlüssel mitgeteilt. Ein ausführliches Verzeichnis der Nährpflanzen und ein Register der Arten mit ihren Synonymen bildet den Schluss des Werkes. Die Abbildungen sind einfache Strichzeichnungen, die Konidien, Träger und Umriss der eventuell vorhandenen Hypostromata von ungefähr 20% aller Arten zur Darstellung bringen.

Das vortrefflich ausgestattete Werk wird allen Phytopathologen und Mykologen, die sich mit *Cercospora*-Studien zu beschäftigen haben, sehr willkommen und ganz unentbehrlich sein.

Lohwag, K., Erkenne und bekämpfe den Hausschwamm und seine Begleiter. — G. Fromme & Co., Wien & München, 1955, 61 pp., 36 Textfig., 3 Farbentaf. — Kart. ö. S 48.—.

Das vorliegende Büchlein ist ein kurz gefasster Ratgeber, der allen Interessenten das Erkennen der wichtigsten Pilzschädlinge des Holzes ermöglichen und zeigen soll, welche Faktoren das Wachstum der holzzerstörenden Pilze fördern und wie sie mit Erfolg bekämpft werden können. Neben *Gyrophana lacrymans* (Wulf.) Pat., dem gefährlichsten und häufigsten Feinde unter den auf bearbeitetem Holze auftretenden Pilzen, werden noch 18 andere, mehr oder weniger gefährliche Holzzerstörer beschrieben und die von ihnen verursachten Arten der Fäulnis beschrieben.

Das mit zahlreichen, schönen und naturgetreuen Abbildungen ausgestattete Büchlein, wird dem Laien das Erkennen der holzzerstörenden Pilze wesentlich erleichtern oder überhaupt erst ermöglichen; es kann allen Interessenten nur wärmstens empfohlen werden.

Moser, M., Die Röhrlinge, Blätter- und Bauchpilze (*Agaricales* und *Gastromycetales*). — Kleine Kryptogamenflora von Mitteleuropa, herausgegeben von H. Gams. Band II b. Zweite völlig umgearbeitete Auflage, G. Fischer, Jena, IX, 327 pp., 17 Textfig. — Kunstlederb. DM 16,50.

Die erste, in Sydowia VII. p. 288 (1953) ausführlich besprochene Auflage dieses Bestimmungsbuches war schnell vergriffen, so dass jetzt nach kaum 2 Jahren schon die 2. Auflage erscheinen konnte. In dieser Neubearbeitung wurde vor allem die seither erschienene, trotz des kurzen Zeitraumes ziemlich umfangreiche, neue Literatur gebührend berücksichtigt. Eine grosse Anzahl von Arten konnte durch Mitteilungen zahlreicher Mykologen und Pilzfreude als sicher im Gebiete vorkommend aufgenommen und zahlreiche Verbesserungsvorschläge verwertet werden. Infolge dieser Änderungen ist die Zahl der *Agaricales*-Gattungen von 124 in der 1. Auflage auf 118 zurückgegangen, während sie sich bei den Gastromyceten um zwei vermehrt hat. Leider sind auch in der 2. Auflage manche Druckfehler und Irrtümer stehen geblieben. Als Beispiel sei hier nur *Myriostoma coliforme* angeführt, das in beiden Auflagen nicht nur im Text sondern auch im Register als M. „ciliforme" bezeichnet wird!

Das vom Verlag vortrefflich ausgestattete Büchlein wird allen Pilzfreunden auch weiterhin gute Dienste leisten, auf Exkursionen ein verlässlicher Ratgeber sein und einen Überblick über die Grosspilze vermitteln.

Roger, L., Phytopathologie des Pays Chauds. Tom. III. — Encyclopédie Mycologique Tom. XIX. P. Lechevalier, Paris, 1954, 898 pp. 7 Textfig. — Brosch. Fr. 10.000.

Die ersten zwei Bände dieses phytopathologischen Standardwerkes wurden schon in Sydowia VII. p. 289—291 (1953) ausführlich besprochen. Der vorliegende dritte und letzte Band des Werkes behandelt noch die durch Moose, Flechten, Bakterien, phanerogame Parasiten und Viren verursachten Krankheiten. Der dritte, den Schluss des Bandes füllende Hauptabschnitt des ganzen Werkes ist einer „Revue des problèmes phytosanitaires des pays chauds" gewidmet, dessen umfangreicher Inhalt nach einzelnen Wirtspflanzen und Wirtspflanzengruppen angeordnet und in 23 Kapitel geteilt ist. Auf den phytopathologisch besonders wichtigen Inhalt dieses Abschnittes kann Raummangels wegen hier nicht näher eingegangen werden. Erwähnt sei nur noch, dass im letzten Kapitel dieses Teiles die parasitischen Pilze und Bakterien der Insekten sowie die mycophagen Pilze behandelt werden. Fast den dritten Teil des vorliegenden Bandes beanspruchen Glossar, Verzeichnis der Autoren, Inhaltsübersicht über alle drei Bände, das Register der Krankheitserreger und ein besonders umfangreiches, nach den Nährpflanzen alphabetisch geordnetes Verzeichnis der Krankheiten. Die überaus zweckmässige Anordnung des Stoffes und die ausführlichen Register gereichen der Benützung des Werkes auch für Nachschlagzwecke sehr zum Vorteil.

Zusammenfassend kann hier nur die Beurteilung der ersten zwei Bände dieses auch für Krankheiten von Kulturpflanzen gemässigter Zonen nicht unwichtigen Werkes wiederholt werden: „Das vom Verlag vorzüglich ausgestattete Werk... kann allen Interessenten wärmstens empfohlen werden und wird gewiss eine weite Verbreitung finden."

Savulescu, T., Monografia Uredinalelor diu Republica populara Romana. — Edit. Acad. Republ. Pop. Române, Vol. I. 1953, 329 u. XXIV pp., 65 Textfig., 43 schwarze, 9 farb. Taf., 22 grosse Tabellen. — Vol. II. 1953, 837 pp., 948 Textfig. — Ganzln. 69 Lei.

Das vorliegende, reich illustrierte Werk ist eine sorgfältig durchgearbeitete Monographie der in Rumänien vorkommenden Uredineen, von denen die auf Kulturpflanzen parasitierenden Arten besonders ausführlich behandelt werden. Im ersten Band werden in den ersten 6 Kapiteln Morphologie, Spezialisation, krankhafte Veränderungen der Wirtspflanzen, Verbreitung, die auf Rostpilzen wachsenden Parasiten und eine Übersicht über das Uredineensystem behandelt. Das 7. Kapitel dieses Bandes ist eine sehr ausführliche Phytopathologie der auf Kultur- und Nutzpflanzen parasitierenden Uredineen. Auf den 22 Tabellen werden die Untersuchungsergebnisse über Anfälligkeit, Schadwirkung etc. von 360 verschiedenen Weizensorten mitgeteilt, die vom Verfasser während eines Zeitraumes von 9 Jahren ermittelt wurden. Auf nähere Einzelheiten kann Raummangels wegen hier nicht eingegangen werden. Erwähnt sei nur noch, dass in bezug auf die Verbreitung zehn Artgruppen unterschieden werden.

Der 2. systematische Teil des Werkes behandelt die bisher in Rumänien nachgewiesenen Uredineen, im ganzen 438 Arten. Jede Art wird ausführlich beschrieben, abgebildet und mit ausführlichen, Bibliographie und Synonymie betreffenden Zitaten versehen. Alle bisher in Rumänien festgestellten Nährpflanzen werden mit ihren Fundorten angeführt. Die ausführlichen Literaturverzeichnisse sind auf die einzelnen Abschnitte verteilt. Ein sorgfältig bearbeitetes Sachregister bildet den Schluss.

Das umfangreiche, überaus reich illustrierte, leider ganz in rumänischer Sprache geschriebene Werk ist eine wertvolle Bereicherung der Uredineen-Literatur, die gebührende Beachtung finden wird.

Schussnig, B., Grundriss der Protophytologie. — G. Fischer, Jena, 1954, VIII, 310 pp., 407 Textfig. — Ganzln. DM 28.—.

Das vom Verfasser im gleichen Verlag vor 2 Jahren erschienene, umfangreiche Handbuch der Protophytenkunde ist in Sydowia, VII. p. 291 bis 292 (1953) ausführlich besprochen worden. Der vorliegende „Grundriss" ist eine kurze, nach streng wissenschaftlichen Prinzipien verfasste Darstellung des im Handbuche der Protophytenkunde behandelten Stoffes, aus dessen Fülle die wichtigsten Probleme der Formung und progressiven Gestaltung der niederen, kernführenden Organismen in ihren Beziehungen zu ökologischen Faktoren geschildert werden. Das in erster Linie für die Studierenden geschriebene Werk soll eine kurz gefasste, analytische Übersicht über den entwicklungsgeschichtlichen Wert der rezenten Gestaltungs- und Abwandlungstypen ermöglichen und ihren Werdegang erschliessen. Dieses Ziel hat der Verfasser nicht nur durch eine zweckmässige Anordnung und Gliederung des Stoffes, sondern auch durch überaus zahlreiche, sorgfältig ausgewählte, instruktive Abbildungen zu erreichen gesucht, die den Lernenden das Verständnis der vielen, zum Teil sehr komplizierten Probleme erleichtern, in vielen Fällen wohl überhaupt erst ermöglichen werden.

Das vom Verlag in jeder Hinsicht vortrefflich ausgestattete Werk wird von den Studierenden sicher als eine willkommene und wertvolle Ergänzung zu den vorhandenen Lehrbüchern der Biologie begrüsst werden.

Die Artikel von p. 1 —431 sind als Sonderdrucke schon im September 1955 zur Ausgabe gelangt.

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